CRAFTS FOR BASIC SCHOOLS

PAPIER MACHE

NATIONAL COUNCIL FOR EDUCATIONAL RESEARCH AND TRAINING

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FOREWORD

Under the scheme for production of literature and other material for Basic education, a sub-scheme is included for production of craft material for Basic schools As a project of this sub-scheme, papier mache craft was assigned to Dev Samaj Training College for Women, Ferozepore City, with a view to studying the possibilities and potentialities of this craft for adopting it as one of the crafts in Basic schools The present publication is a report of this project and is being brought out by the Institute as a part of its series entitled, "Crafts for Basic Schools." The report describes methods, material and process of papier mache craft and gives some suggestions regarding the syllabus and educational aspects. Some hints for teachers and a bibliography are also included

It is hoped that this publication will be found useful to those institutions which are interested in experimenting with this craft. Any comments and suggestions will be most welcome.

J. K. SHUKLA
Director

NATIONAL INSTITUTE OF BASIC EDUCATION,
41-A, FRIENDS COLONY,
NEW DELHI-14

PREFACE

It is a great pleasure that the report of the research project on Papier Mache craft is being published I should like to take this opportunity of expressing my sincere gratitude to the Ministry of Education, Government of India, for the opportunity afforded to my College for working on this project Earnest and sincere efforts were made in the College to do the best on the research project allocated by the Ministry of Education. The major credit of the work goes to Prof Amar Nath, Head of the Department of Education of this College, who inspite of his multiferious duties, worked as an Hon. Prof -in-Charge for this project His able guidance and the untiring efforts of Shri L R Singhal, Research Assistant, have contributed to the completion of the project and the preparation of the report I am grateful to them for their conscientious work.

I should like to express gratitude to the various agencies and individuals who extended their cooperation in making the study possible.

DHARAM VIR
Principal
Dev Samaj Training College for Women,
Ferozepore City.

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INTRODUCTION

Chapter I

Present Study

PROBLEM AND ITS NEED

Mahatma Gandhi referred to Basic Education as education in and through work He wanted work to vitalise learning and learning to vitalise work Once he very correctly remarked that he wanted not only "thinking brains" but also "thinking fingers". It was, therefore, very strongly felt to do away with the divorce between learning and working which existed in the traditional Indian educational system This he sought to do through the introduction of crafts.

To-day the importance of crafts has been widely recognised in every progressive system of education In Basic Education craft occupies a very important and significant place as it serves as a befitting and useful medium for imparting academic knowledge in all subjects It helps in relating the subject contents with the actual experiences and life situations in relation to the natural and social environments and the processes of productive work. Hence the teaching of and through crafts is a most significant feature of Basic Education

Crafts like Spinning and Weaving, Gardening and Agriculture, Wood Work, Metal Work, Leather Work, Clay Modelling and Pottery were recommended as suitable crafts for teaching in Basic schools. But the craft of Papier Mache was not given a place among these crafts, as the possibilities of introducing it as one of the major crafts in Basic schools had not yet been explored It was, therefore felt necessary to probe into the potentialities of this useful and popular craft of this country for its introduction in the Basic schools. The Dev Samaj College for Women, Ferozepore City had the provision of teaching this craft as an optional subject or hobby to its students. Therefore, the offer of the Ministry of Education, Government of India, to undertake the research work in 'Papier Mache' was welcomed and readily accepted This afforded the College an opportunity to study the various aspects of this craft systematically and scientifically so as to determine its suitability for its introduction in Basic schools.

PURPOSES

The following were the main purposes of the Study.—

(i) *The Study of the existing work*

The work of Papier Mache is carried on in many parts of this country—Kashmir, Punjab, U. P, Rajasthan, Bihar, Orissa etc In order to study the actual working of this craft visits to a few selected important centres, Rajpura, Jaipur and Srinagar were planned Because of limited resources and time the study was confined to these centres only. Information was to be collected in respect of the raw material used, the processes involved, finishing, painting and decorating etc., so as to study the implications, difficulties and complexities of this craft.

(ii) *Experiments*

To experiment on the information collected and to modify, improve and make simpler and less costly the processes involved in making Papier Mache articles Study of the suitability of different raw materials available in the vicinity of the schools—such as waste paper, rice straw, wheat straw, banana leaves, rags, pith of the reeds, 'munj', grass etc, for making fine quality of pulp Standardising of the recipes for making good papier mache for different purposes, i e, determining the ratio of the ingredients like clay, chalk, plaster of paris, gum, glue, paste etc., to be mixed with pulp

(iii) *Study of the educational possibilities and potentialities of integrating craft of Papier Mache into school work*

To study the extent to which Papier Mache could be exploited to serve as an effective basis of the correlation of knowledge and teaching of various school subjects like Social Studies, General Science, Mathematics, Mother Tongue, Drawing, Painting etc, and the extent to which this craft could be spread over the various grades in respect of its gradually increasing difficulty and complexity and also to determine the extent to which it could be utilised to develop cultural, aesthetic and moral aspects of child's personality

(iv) *Preparing a syllabus*

Drawing up the correlated syllabus for different grades with this craft as the centre of correlated activities and the basis for imparting academic knowledge and suggesting the targets of attainments by different age groups.

(v) *Preparing a pamphlet*

Preparation of a pamphlet on this craft for the benefit of the teachers of the Basic Schools and teachers of Basic Training Institutions.

THE PROCEDURE

The following procedures were adopted in the completion of the project:—

(i) *Study of the relevant literature*

Inspite of the best efforts no book connected directly with the subject could be procured. However, whatever literature was available in the form of books or articles was studied

(ii) *Discussions with the experts of this craft*

It is regretting to remark that the professional experts are conservative in their outlook They were, therefore, found very much reluctant to part with any useful information, as they thought that any information imparted would be disadvantageous to their interests. Almost everywhere, especially at Jaipur and in Kashmir, the information given was very much misguiding It was after consistent efforts that some data and important information could be collected

Besides the professional artists an opportunity of discussing the subject under reference with the following experts was availed of:—

1 Prof. I D. Minocha, P.E S., Govt Post-Graduate Basic Training College, Chandigarh.
2. Shri T. Y. Deo, Special Officer (Crafts), National Institute of Basic Education, New Delhi.
3. Shri C. L Khoru, Principal, Govt Industrial Institute, Srinagar.
4. Shri S S Jalali, Papier Mache Expert, Srinagar.

(iii) *Visits to the Centres of Papier Mache*

In order to gain first hand information and observe closely the processes involved in the craft of Papier Mache visits were arranged to the following places:—

(i) In Punjab—Rural and Urban areas, especially Rajpura and Oel (Distt Hoshiarpur)
(ii) In Rajasthan—Jaipur
(iii) In Kashmir—Srinagar and the neighbouring villages

Detailed information regarding these visits and the information collected is given below.—

1. *Visits in the Punjab*

Kasturba Sewa Mandir at Rajpura and Gandhi Udyog Ashram at Oel (Distt Hoshiarpur) which are known for hand-made paper and papier mache work were visited Unfortunately Papier Mache work had been suspended for some months in these centres The processes of preparing pulp for making hand-made paper were closely studied, as these were directly connected with the project It is a lengthy but simple process Paper is mostly manufactured from rags. Rags are very cheaply and easily procured from Ludhiana which is a centre for hosiery and textile industries. The waste material from these industries provides the chief raw material for paper making The various processes in the craft were studied on the spot including rating, cutting, cleaning, washing, boiling, digesting, beating, bleaching, pressing, calendering and final finishing and glazing

The following information relating to the craft of papier mache was collected from the observations of (1) the moulds prepared for papier mache work, (2) the finished and unfinished articles and (3) the process of preparing pulp —

1 Papier Mache could be prepared by mixing paper pulp or 'kuttie' with chalk or china clay No information could be gathered regarding the ratio of the ingredients as the papier mache expert had left the services in the centre The work here was also at an experimental stage

2. Moulds could be prepared from Plaster of Paris and chalk easily As shapes of the moulds were not much appealing and presented difficulties in storing and classification, they needed much improvement.

3 Beating of rags into pulp for papier mache craft was not economical as it required complicated mechanical and chemical processes Hence it can not be adopted in an average Basic school.

4 Waste paper should be the chief ingredient as it could easily be beaten into pulp and did not require much of chemical treatment The possibilities of using rice straw, wheat straw, grass etc, should also be explored, as these were found in abundance in the district of Ferozepore, especially in the riverine tract along the bank of the river Sutlej.

2 *Visit to Jaipur*

Jaipur, the chief centre of Papier Mache craft, was visited next by the Professor-in-Charge and the Research Assistant in the 3rd week of August, 1958. By this time much useful information had been secured and some data collected through experiments on the basis of the previous experiments and the observations at Rajpura This helped in the collection of further data and information related to this craft by careful study of the processes at Jaipur.

At Jaipur Papier Mache craft is carried on as a cottage industry. Almost every house in some 'bastis' is a workshop. Those in the trade do not perhaps tolerate any rivalry, they were, therefore, much reluctant to part with any information Through the kindness of Assistant Director of Industries, Rajasthan, a workshop run by co-operative societies was visited. It was observed that this craft required skilled as well as unskilled labour. The unskilled labour is supplied by children and women folk The work of paper sorting, tearing, washing, soaking and beating paper into pulp is done by children and women Again, the work of dipping the articles for first coating and rubbing them with sand paper which requires unskilled labour is entrusted to children The experts are employed for designing, modelling, preparing moulds, casting the articles, painting and finishing 80 per cent work needs unskilled labour For painting also there are set designs Stencils are also used.

Articles prepared have a very smooth and bright glaze, the colours are bright and the painting is life-like Mostly birds, animals, dolls, small statues, vegetables, fruits, etc, are manufactured and are given very attractive look The art is hereditary. It has come down through several generations The industries department had started giving training to the desiring people in this craft in the industrial school run by the Central Government It was disappointing to learn that the training had been suspended for some reasons

Howerver, the following information was collected from these sources.—

(i) Moulds are prepared from clay and are then baked

(ii) Paper pulp is prepared from waste paper which is kept soaked for about 24 hours and then beaten into pulp with the help of ordinary 'musli' and 'Okhal' or 'Sill Batta'.

(iii) Three main types of papier mache are prepared for three distinct purposes of casting, shaving and joining Paper pulp is mixed with Delhi chalk and gum. Variations in their proportion give these three varieties of papier mache.

(iv) For finishing and glazing a coat of plaster of paris or 'Bansku ka chalk' ground into fine paste is given.

(v) Ordinary dye colours mixed with gum and 'Bansku ka chalk' are used for painting.

(vi) For casting two-piece moulds are mostly used

(vii) Depressions are filled in by applying fresh 'kutti'.

(viii) Glaze is given by rubbing the articles with a rough piece of cloth.

3. *Visit to Kashmir*

Kashmir is known for the papier mache work of a very high order The articles prepared are of a fine quality and are very tastefully painted in beautiful designs. The painting is very attractive and durable Gold and Silver work on the articles is a speciality of this place With a view to study this craft from close quarters and to obtain correct information in respect of the recipes for papier mache, paints and various processes of manufacturing these papier mache articles, the Research Assistant went to Kashmir and spent 10 days there and studied this craft in details. At Srinagar he met some artists and other people connected with this craft, but no useful information could be gathered It was learnt that this craft is carried on mostly by the villagers as a cottage industry So he went into the interior of Kashmir to obtain first hand information. There he contacted some people of this trade. The information collected is as follows:—

(a) The raw material for paper pulp is taken from banana bark and leaves, 'munj', coconut husk, linseed stalks, rice straw, "babigan" grass, rags, waste paper etc Results obtained from these raw materials except waste paper were not satisfactory For articles of fine quality they prepare pulp from waste paper.

(b) Instead of glue or gum they mix rice starch with pulp as sticker, as this makes the articles as hard as wood, with a metalic ring. Rice, being staple food of Kashmiris rice starch which would otherwise go waste is used in this craft.

(c) Moulds used are solid ones and are prepared from Plaster of Paris or wood. Actual objects or their models are also used as moulds.

(d) Glue solution is used for coating, joining and preparing colours, or paints.

(e) Gold and Silver leaves are dissolved in gum solution and sodium chloride (common salt) to obtain beautiful golden and silver colours for painting. (Full process for painting is discussed in Chapter X.

(f) In order to obtain a smooth surface the articles are rubbed with rough sand stone before painting To give glaze on the gold paint it is rubbed with a special type of stone known as 'agate' In its place we can use round base of a hard glass test tube.

(g) Generally decoration pieces and some utility articles are prepared

(h) No clay or chalk is mixed with pulp to prepare papier mache.

4 *Experiments*

A number of experiments were performed on different raw materials to study the possibilities of their being converted into pulp It was observed that for rough type of work rice straw, moonj, linseed stalks etc., could be used. These take very long to soften and need hard labour, besides chemical treatment, for beating them into fine pulp Hence their general use in Basic schools may not be advisable. Waste paper is most economical and easiest to handle. Experiments in respect of stickers have also helped in discovering new combinations and improvements upon the processes in vogue. Important finding, observations and conclusions are given in Chapter IV on 'Methods of Preparing Papier Mache' Experiments in the preparation of moulds also helped in making marked improvements upon the types of moulds prepared in different centres.

Experiments were carried out in colouring, painting, and designing as well. New combinations in colouring and designing have been discovered These are given under a separate head

The experiments were governed mostly by the aims of the project i.e., the educational potentialities of this craft Hence every effort has been made to make the processes as simple and cheap as possible. It is a matter of much joy that the processes evolved and the recipes discovered are really suitable for our Basic schools There is no complexity in any of the processes suggested.

LIMITATIONS OF THE STUDY

Inspite of the best efforts made in working with the craft of papier mache the project has suffered from certain unavoidable limitations The following factors, unavoidable as they proved, were mainly responsible for the shortcomings in the study:

1 Lack of relevant literature on the subject of papier mache.

2. Lack of co-operation from the men in the field of this craft.

3 Limited time and resources

4 Lack of time for basing the syllabus suggested upon experiments in Basic schools.

Chapter II

Papier Mache as School Craft

Educational Value of a Craft

To-day the principle of using craft and productive work as the medium of education is being increasingly given importance, not only in India, but in other countries as well The Report of International Bureau of Education has indicated that "Crafts are highly valued as a means of presenting the content of other subjects in a concrete form." Basic system of education which has been adopted as the accepted pattern of education in India makes crafts the centre of all education and uses it as a basis of correlation of knowledge

In order to make education more realistic and useful in which children may feel personally interested, it is essential to provide them with some centre of interest or some purposeful activity This activity should be recreative, productive or creative and educative, in which the child could employ his head, heart and hands Child loves to do things with his own hands and has a craving to satisfy his creative instinct Just watch the children at play and see how they employ their hands and learn new things by handling and touching different articles. The hands play a very importantt part in child's early education. But it was very sad that the training of hands and their use in some guided constructive activities was woefully neglected But in recent times education has received a new and wide definition and scope. It stands for all the influences that mould life and aims at an all-round training needed for life Hence in Basic Education craft has been given a very important place.

Craft has been recommended as a means of education and development of the individual Craft means skilful work done by hand, useful and beautiful. Craft plays a vital part in the forming of character and the education of the will It demands attention, concentration, perseverance, accuracy and method and creates habits of orderliness. neatness, precision and foresight Craft helps in developing wholesome personality, team spirit, respect for manual work, awareness of beauty and satisfaction of creative urge The essence of this craft-centred education (Basic Education) has been given by Mahatma Gandhi in these words:

"It means a new educational technique where progressive self-reliance in all respects of a healthy and balanced life—economic, physical, social, moral and cultural—forms the medium of education; and the necessary knowledge of subject matter is given, habits and attitudes formed, and faculties developed, through this process"

Again he remarks that "productive work should not only form a part of school curriculum—its craft side—but should also inspire the methods of teaching all subjects"

Selection of a Craft

Now that the principle of education through craft has been accepted and well established, it is no use advocating it any more Every school has to make provision for some craft which can be utilised for the purposes discussed above The next question is of selecting a suitable craft *The Hand Book for Teachers of Basic Schools* printed by the Ministry of Education, Government of India, contains a wise suggestion on the selection of a craft·

"In the choice of Basic Crafts which are to be integrated into School work we should adopt a liberal approach and make use of such crafts as have significance from the point of view of educational content, provide scope for progressive development of knowledge and practical efficiency The Basic Craft must be such as will fit into the natural and social environment of the school and hold within it the maximum of educational possibilities"

Hence the following criteria are suggested for the selection of a Major Craft:—

1 The Craft selected should be interesting, useful, inspiring and economical
2. It must present progressive difficulty and complexity in the processes, in the use of the raw materials, instruments and other accessories to meet the demand of the pupils of all stages according to their growing needs, both physical and mental
3 It should afford ample opportunities for a co-ordinated training in the use of hand, head and heart.
4. It must have potentialities of correlation with other school subjects
5 It should satisfy the productive instinct of the pupils, arouse interest and satisfy their curiosity
6. There must be a constant supply of raw material throughout the school year.
7 The finished products must find a place in the market, and fetch some profit,

Papier Mache as a Major Craft

As such only a few crafts like Spinning and Weaving, Agriculture, Gardening, Metal Work, etc., were recommended as major crafts It has, however, been realised that many more crafts could be taken from the hobby or minor crafts list to the major crafts list Papier Mache can be one of them It can safely be recommended for introduction as a Major Craft in Basic schools as it has the following educational potentialities:—

1 The raw material required for this craft i.e , waste papers, rags, card board etc., can be had in all seasons and in almost all schools.
2. The other ingredients needed are also easily available everywhere and can be stored without any fear of damage
3. This craft needs very simple instruments and apparatus which can be had and got prepared locally and even in the school workshop
4. The papier mache goods have ever been much in demand and fetch good price.
5. The articles produced are of great artistic value and are also of general utility.
6 This craft arouses and sustains insert and satisfies the curiosity of the pupil. It helps him in gaining knowledge and in the development of his body and spirit.
7. While learning this craft children get sufficient opportunities for a co-ordinated training in the use of hand, head and heart
8. This craft provides richness and variety of processes involving scientific and intelligent understanding.
9. This craft has grading potentialities and capacity to relate pupils to community
10. Practically all the subjects of the school curriculum can be easily correlated with this craft as the children study its follwing aspects:
    (i) Raw material,
    (ii) Tools and instruments to work with, and
    (iii) the processes involved in the preparation of papier mache

Aims of Introducing Papier Mache Craft in Basic Schools

1 It enables the children to make use of the waste material such as, waste paper, broken articles, waste rags and straw etc., with a consciousness for economy is a poor country like India This material

otherwise goes waste This can be utilised in preparing articles which can fetch good income This craft has more chances to make the school self-sufficient The cost of raw material is negligible.

2 It makes the pupils more resourceful as they are required to explore the possible sources of waste paper and other raw materials They have to improvise the moulds both solid and hollow Broken bottles, cups, steel pipes, trays, baskets, broken toys etc, can be utilised

3. It develops the physical, mental and aesthetic aspects of child's personalitity. This craft provides ample opportunities of manual work resulting in the development and co-ordination of muscles and teaches them the dignity of labour.

4 Since this craft involves designing, painting and sculpturing, it has much scope of developing aesthetic taste and sense of appreciation in the children

5 It provides chances of best use of leisure.

6. It provides basis for the specialised training in Fine Arts like drawing, painting, sculpturing etc, since in this craft much use is made of carving and sculpturing for preparing models for moulds, drawing and designing for decoration and painting to bring out the fine details of the designs

7. It develops some social and moral virtues such as 'espirit de corps', patience, love for labour among the pupils

8 It provides sensory training to the children. While sorting the papers according to their colours, weight, texture and size, pupils will develop their senses of sight, touch, smell, pressure and hearing. The other processes such as smoothening and finishing also afford opportunities for this training

9. It sublimates the destructive and creative instinct of the children Paper tearing and beating will give much pleasure to the children. They will also derive much joy by creating and producing beautiful articles in artistic designs Their instinct of acquisition will also be satisfield when they are required to collect raw material such as paper pieces, toys, broken articles etc.

10 It provides incentive for work. As the children see the articles growing and taking the final shape they feel more and more encouraged to put in more work.

11. It helps in correlated teaching in all the subjects of the curricolumn.

12 It prepares the child for vocation to earn his living or to supplement his income. Some of the children may develop sufficient taste and skill in this craft during their school days and may choose it as a vocation in their later life

In short, Papier Mache is a craft which can be introduced in our Basic schools both urban and rural with the minimum finances. It can be adopted irrespective of environmental conditions Moreover this craft has been practised since long, and therefore is rich in all aspects Its raw material ranges from ordinary clay to the Plaster of Paris, from simple and easily obtainable gum to rice starch and glue, from earth dyes to tempra colours and gold and silver paints. The instruments also range from simple solid moulds to complex hollow and many-pieces moulds, their designing in order to produce different types of papier mache articles also grows in complexity The processes are also varied and provide a great range Starting with easy and simple activities like sorting, tearing, soaking, beating, mixing, drying, removing and cutting etc, they go to smoothing, filling, designing, painting, sculpturing, drawing and colouring In this way a great part of Fine Arts like drawing, painting and sculpturing is covered. This craft has also the potentialities of gradation over the period of schooling and its correlation with other school subjects There is a regular and constant progression. From Grade I to Grade VIII the child can go up the ladder learning and mastering these processes and attaining skill and mastery in the production of useful and beautiful articles Thus in his after life the child can retain this craft as a useful hobby or if need be can adopt it as a vocation to earn a living. If it is adopted as a profession other members of the family can also lend their hands to push work and supplement the income.

2

PAPIER MACHE AS A CRAFT

Chapter III

Brief History of Papier Mache as a Craft

'Papier Mache' is a French word which means mashed or chewed paper This term embraces numerous manufactures in which paper pulp is employed, pressed and moulded into various shapes This craft was popularly practised in Europe about 200 years ago. In reality it is not a French Craft and it is many thousands of years older than that. It had long been practised in the East When weapons were bows and arrows Chinese soldiers used to make their armour, shields and helmets from what we call papier mache It can be regarded as one of the earliest forms of plastic and indeed it can be used for making small table tops, trays, vases, dolls' heads, masks, models, caskets, bowls, picture frames, pots, toys, wall decorations and many other things Chinese and Japanese and many other oriental nations are experts at this work, particularly with decorations and make beautiful things out of this humble material—old waste and scrap paper, repulped and mixed with a strong size of glue and paste To this very often are added large quantities of ground chalk and clay.

Persians are said to be the masters of this craft. Persia has produced great artists, sculptors and architects such as 'Wahizad' 'Sultan Mohammad Noor', 'Miraq', 'Abbul Samad Shirazi' and many others. The Persian artists used to paint big halls, drawing rooms and auditoria As those were used mostly for musical concerts, recitation of poems, symposia etc., they felt the need of some acoustic material to control the echo They discovered that papier mache could serve this purpose most cheaply and easily. They controlled the sound or the echo by plastering the walls and ceiling with a thin layer of papier mache before painting them Besides this advantage, papier mache provided a suitable ground and texture for artistic painting Assembly Chamber (Hall in Maharaja's palace) in Srinagar is a living testimony to the fact that Papier Mache was used for acoustic arrangements and also to provide a good texture for artistic painting. Even in modern times papier mache is used widely for construction of public meeting halls, opera and theatre halls which need sound control or checking of echo.

Later the Persians started preparing articles of papier mache as by use they found that they were lighter and more durable. They painted these articles in beautiful and artistic designs which became very popular With the advent of the Mughals in India the papier mache articles were brought to India by the traders. With the passage of time the demand of those articles increased and this tempted some Persian master-artists to migrate to India. Sultan Zainulab Din of Kashmir (better known as 'Bara Shah') is considered the first patron of this art in India. He encouraged Persian artists to come to India. This art flourished in Kashmir and even to-day Kashmir is famous for papier mache work of a very high order. Kashmir, being a valley of colourful flowers, beautiful trees with fine leaves and charming scenes, provided a rich material for beautiful ornamental designs. The attractive paintings on papier mache articles are mostly environmental. Kashmir is the home of papier mache craft

The Mughal Emperors like Akbar, Jahangir and Shah Jahan also patronised this beautiful art They gave a great impetus to this art in India. So, besides Kashmir, this art made its home in the capital towns of Jaipur, (Rajasthan), Delhi and Agra. Papier mache took deep roots in India and this craft was adopted by many people as a vocation at these and many other places.

As paper pulp is the chief ingredient so this craft is carried on at hand-made paper manufacturing centres also as a side craft The waste material or pulp is used for making beautiful toys. At Faizabad U. P. Government has opened a centre where, besides making hand made paper, the articles of papier mache are also manufactured.

This craft is found even in the undeveloped Indian villages, though in crude form. Women prepare papier mache by mixing paper pulp with Indian clay and they make baskets and containers by casting them on the inverted earthern pitchers.

Papier mache is an inexpensive craft which has ample scope of development. Papier mache articles as prepared by the artists of Kashmir, Rajasthan, U. P. and Bihar are very attractive and popular. There are different methods of working with papier mache at different places. At Kashmir generally decorative articles are prepared and the painting is exquisitely artistic. Jaipur work mostly comprises of animals, birds and toys, Agra is also known for papier mache fruits, toys, human figures and birds. Different places have specialised in different types of papier mache articles.

Chapter IV

Methods of Preparing Papier Mache

As already mentioned in Chapter III there are different methods of preparation of papier mache at different places The ingredients used and their ratio vary with different places. Some of the most important and widely employed methods are the following:—

1 Western Method.

2. Jaipur Method

3. Kashmir Method

WESTERN METHOD:

This involves pasting of paper pieces on a mould. The procedure would be as given below:—

Sorting

First of all waste paper collected is sorted. Paper of uniform thickness is picked out Paper pieces of different colours and quality are piled separately.

Paper Tearing

The selected and sorted paper is torn into small pieces of not more than one inch on either side, as big pieces give an uneven surface They should not be cut with a razor or a pair of scissors otherwise the surface becomes smooth and less adhesive

Pasting

Some solid mould is taken and it is dipped into water in order to make it completely wet (See Fig. 1) Then wet pieces of paper are pasted on its surface. The first layer is applied with water only (Fig 2) No paste, gum or glue is used at this stage as it would otherwise become difficult to take off the article from the mould. The article sticks fast to the mould. Thus the surface of the mould gets spoiled When the whole surface of the mould is covered with wet paper, the second layer should be pasted with liquid gum or paste This process is repeated till the mould is covered with 20 to 30 layers in proportion to the size of the mould. For a bigger mould even more layers may be needed. It is always advisable if the colour of the paper is changed after each layer. This helps in assuring that the whole surface of the mould has been covered with this particular layer Moreover this helps in maintaining the uniform thickness It is then allowed to dry gradually To dry it in the sun or by applying heat may give an uneven surface Ordinarily it takes 25 to 35 hours When it is dry it is taken off the mould No difficulty is experienced in case of flat objects such as plate, dish, tray, cup or 'katori' of uniform width, but in case of solid moulds like caskets, small boxes, powder cases, flower vases and table lamps etc., the papier mache articles should be cut according to need into two pieces or more with a sharp knife or a saw (Fig 3) The cut pieces are later joined together with the help of thick solution or thick paste In order to preserve the shape and fix it up a strong string is tied tightly round the article (Fig 4) The separate pieces can also be joined by stitching them by strong thread Card board can be easily used for bases The article is now ready for finishing and painting processes

JAIPUR METHOD:

Paper pulp or 'Kutt' forms the chief ingredient of papier mache in this method. The process of preparing paper pulp is discussed in Chapter VII In this method three varieties of papier mache are used for different purposes Their recipes and the purposes for which each variety is used are as under·

(i) *Papier Mache for Casting*:

Paper Pulp	1 seer.
Gum	¼ seer.
Delhi Chalk	3 seers

This papier mache is used only for casting the articles in moulds

(ii) *Papier Mache for shaving or filling*:

Paper pulp	1 seer.
Chalk	8 seers.

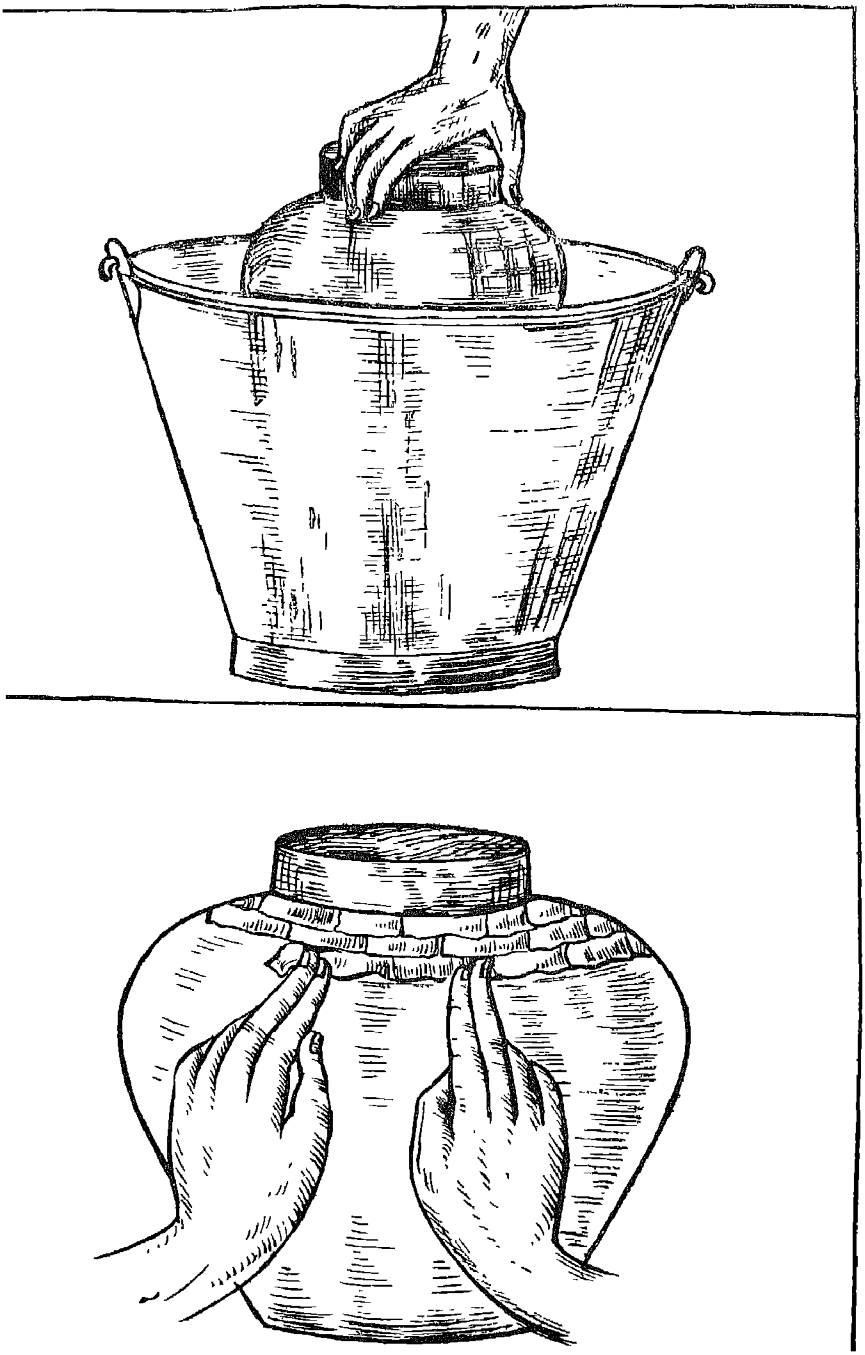
This variety of papier mache is used for filling the crevices and depressions, if any, which are caused by shrinking of the articles when dried It is also used to give the articles the required shapes.

(iii) *Papier Mache for joining*·

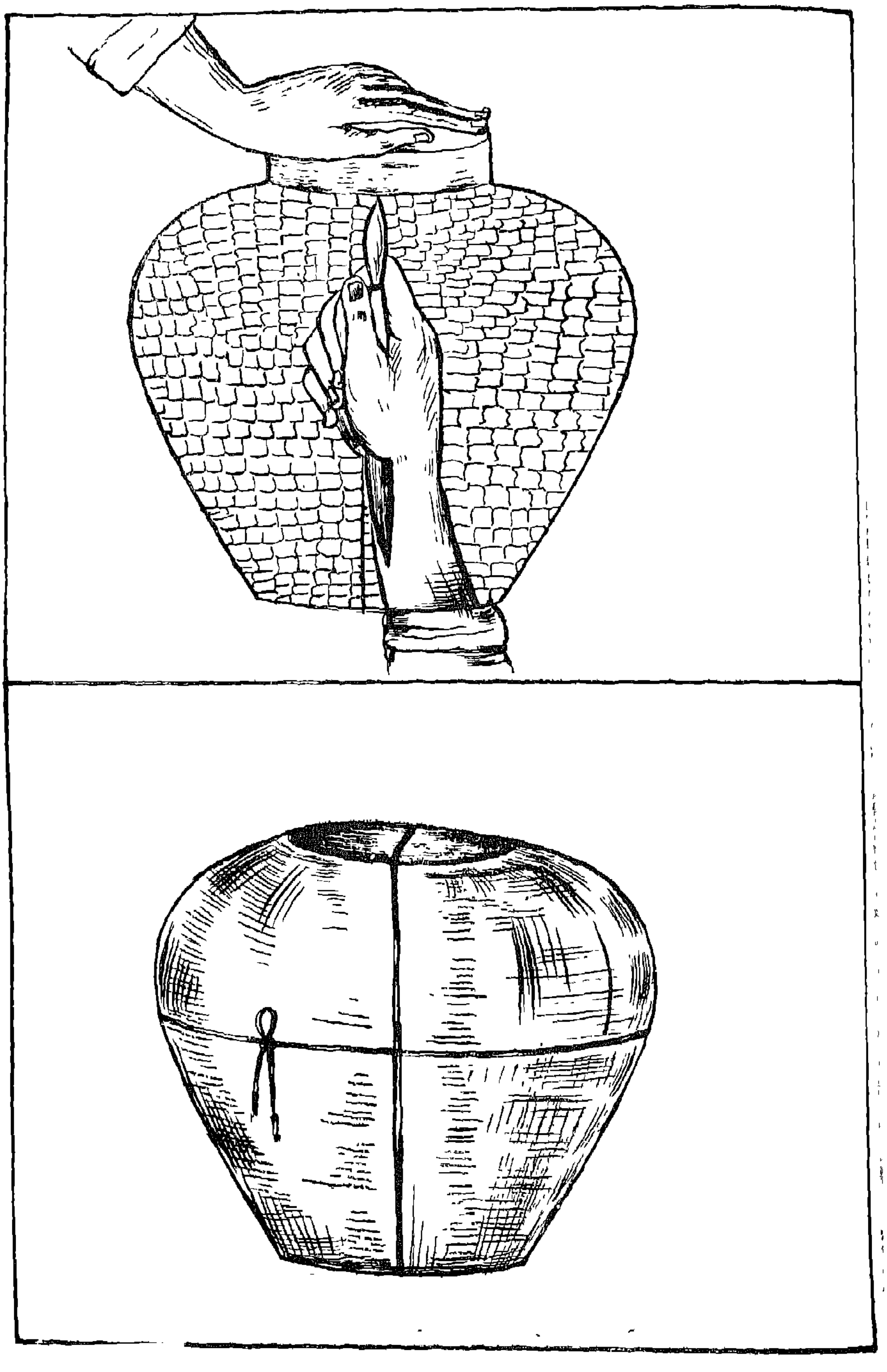
Paper pulp	1 seer.
Gum	½ seer.

In case the papier mache articles are removed from moulds by cutting, the pieces thus formed are joined together with this kind of preparation of papier mache.

ting in Western Method (Dipping) Fig. 1



Removing article from the mould **Fig. 3**



KASHMIR METHOD:

Paper pulp and rice paste are mixed in the ratio of 2.1 (The preparation of paper pulp is given in Chapter VII and the preparation of rice paste is mentioned in Chapter V). In place of rice paste, rice starch can also be used with advantage Rice starch is a bye-product in boiling rice for eating It is a thick liquid which is drained off by means of a strainer after boiling rice in water It is cheaper and brings good results.

This recipe is ideal in the sense that it makes the article hard and durable and light.

FEROZEPORE METHOD:

Following are some of the recipes which were found yielding even better results. These are the results of experimentation at this centre:

(1)	Paper pulp	100 parts
	Delhi Chalk	10 parts
	Glue solution	15 parts
	Rice starch	15 parts
(2)	Paper pulp	½ seer.
	Rice starch	6 chhattanks.
(3)	Paper pulp	½ seer
	Delhi chalk	1 seer
	Paste (prepared from 'methi', 'gwara' or 'mash' seeds	1 chhattank
(4)	Paper pulp	½ seer.
	Gum babool	¼ seer.
	Delhi chalk	¼ seer.
(5)	Paper pulp	½ seer
	Glue solution	½ chhattank.
	Delhi chalk	½ seer.

NOTE:—Nos 1 and 2 are recommended for use in making articles of fine quality.

Processes of preparing pastes and solutions are discussed in Chapter V.

Chapter V

Material for Papier Mache Craft

I. RAW MATERIAL FOR PULP

Almost everything which can be beaten into pulp easily can serve as raw material for papier mache, and then it should be easily available in the locality. The Research Assistant experimented with different possible materials such as Rice Straw, Rice husk, 'Munj', Wheat Straw, 'Bhabbar' grass, leaves of banana, rags, sugar cane leaves, linseed stalks and waste paper It was discovered that all these raw materials except the waste paper, require a lot of labour and patience, besides chemical treatment with one or the other alkali In our Basic Schools we cannot afford to spend much time Moreover, the children in the elementary and even in the middle classes cannot use soda ash and other chemicals as required. It may also be pointed out that young children do not have the patience to wait for the results. It gives them much pleasure and satisfaction to see their finished products, with the minimum possible labour and time

Rice husk does not yield to any chemical, whereas rice straw, 'munj', wheat straw, 'Bhabbar grass' and banana leaves require soaking for at least 30 days. Then they must be treated with soda ash or some other alkali. The pulp prepared does not give encouraging results. Beating of rags requires special type of beaters and chemical treatment which are costly and difficult to be handled by young children For boiling rags a digestor is a necessity But all schools cannot afford to buy it. Hence, as stated above, it was concluded that only waste paper should be recommended as the most suitable raw material for preparing papier mache in our schools

Procurement of waste paper will not present any difficulty in any school. The waste paper is available in many schools in the following forms:

1 Old examination answer books of house tests.
2 Old exercise books.
3 Old and useless books
4. Old news papers
5. Waste correspondence
6. Old records
7 Old charts and wrapping paper.
8. Paper cuttings from press.

Every school may have a box or tin placed at a convenient site for the collection of waste paper. The children and the members of the staff should be instructed to throw the waste paper of every type in that box This will incidentally help in keeping the school neat and clean.

Children can be asked to bring waste paper from their houses if need be The paper thus brought may be utilised by these very children for their own use in the classes.

It is estimated that waste paper sufficient to last for the full year can be collected in the manner given above Thus this craft will not be a drain on the school finances.

II. STICKERS

Stickers of one or the other kind form an essential ingredient of papier mache, as there must be something to keep the ingredients together In different processes different types of paste or sticking material is used The following materials are recommended.—

1 *Paste Prepared from wheat starch*

This is an ordinary thing which can be prepared very easily. Take wheat starch (*maida*) and water in the ratio of 1:2 After beating the solution thoroughly with fingers, put it on fire in a kettle with a wide mouth After boiling for some time it will solidify and become sticky. The paste will be ready for use. Avoid putting any colour or even copper sulphate in it It will spoil the surface of the articles for painting.

2 *Paste prepared from Rice Starch*

Take some rice flour and prepare paste in the manner as given above This paste makes the articles very strong and durable The articles become as hard as wood and give metallic ring They are lighter and finer This type of paste is most useful. Thick liquid decanted off the boiled rice will also serve the same purpose

3 *Gum*

Sticky gum especially that of 'keekar' or 'babool' is most suitable for papier mache Experiments have shown that this gives very good results. It is cheap and easy to handle The gum solution can be prepared by mixing finely ground gum in water in the ratio of 1 2 Beat the mixture properly and put it in the sun or on fire for some time. It will accelerate the formation of a homogeneous mixture.

4. *Glue*

Take glue of good quality Grind it into fine powder This can be easily mixed with paper pulp without preparing any solution. It also gives good results.

5. *Paste from Tamarind seeds*

This can also be used as an adhesive substance for preparing papier mache Following method is suggested for the preparation of paste:—

Soak the tamarind seeds in water for 12 hours Peel off the upper crust. Then, grind the inner substance into paste either with 'Sile Batta' or with 'pestle and mortar'.

6. *Paste from 'gwara' and 'methi' seeds and 'mash'*

'Gawara' and 'Methi' seeds and 'mash ki dal' can also be used for the preparation of paste Keep them soaked in water for 12 hours and then prepare paste as suggested in No. 5. These can also be grounded into powder or flour. Paste can be prepared by mixing this powder in water These also give good results but there is one disadvantage—the articles prepared may be damaged by rats.

III OTHER SUBSTANCES

1. *Chalk*

Chalk is very important substance required for papier mache articles. Delhi chalk is recommended It is available in any quantity from Delhi It gives very smooth surface for finishing At the time of purchase, care should be taken to see that the chalk has a soft touch

2. *'Bansku Ka Chalk'*

It is dug out from the quarries near Jaipur and is used for glazing in Jaipur process.

3 *Plaster of Paris*

It is a white powder and is used both for preparing moulds and for giving an even surface to the articles for painting

4. *Multiani Clay (gajni)*

For ordinary articles this can be used in place of chalk But, as it costs more than chalk it may not be economical for use in the schools.

5 *Potter's Clay*

It is used for preparing models and moulds It is cheaply and easily available everywhere.

6. *Chemicals*

(i) Caustic soda solution 4% to 6%
(ii) Washing soda solution 4% to 7%.
(iii) Bleaching powder.

7. *Tissue Paper*

It is commonly known as kite paper It is used for levelling the surface of the articles

8 *Wire and Tin plates*

They are used in making models and articles Various parts of human, birds and animal bodies, are prepared from them.

IV TOOLS AND APPARATUS

Most of the work is done by hands and fingers. Still to facilitate work and to bring out fine details some tools are necessary. The list is given below:—

1 *Knives*—Knives of different sizes for rough and fine work are needed. The knives should be provided with wooden handles, as shown in the fig 5. Knife with a sharp and broad blade and a long handle is required for cutting the papier mache articles from off the moulds.

2 *Small Knives*—Knives with a narrow blade ¼″ broad and 1″ long is needed for cutting details in modelling

3 *Nail cutter*—The nail cutter should be thicker in size as compared with ordinary nail cutter It is used for bringing finer details. (Fig. 6)

4 *Masons' 'Majhola'*—(A piece of flat iron sheet fixed in a wooden handle). It is used for beating, pressing and smoothening the papier mache applied on mould Fig 7)

5 *Thapki*—A small wooden thapki as shown in (fig 8) is required for beating and setting the papier mache on the solid moulds.

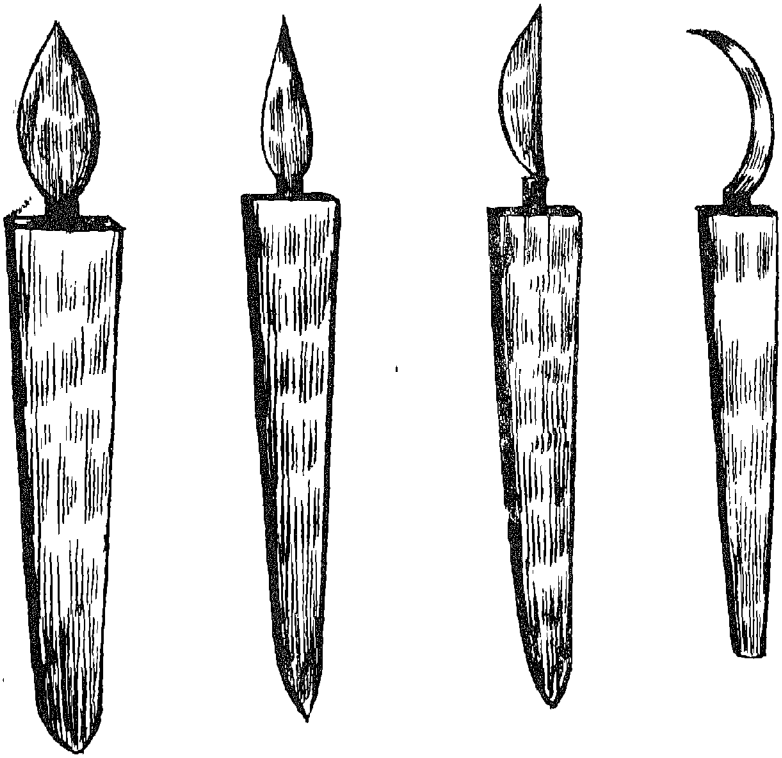
6 *Sand Papers* from 0 number to 2 number fixed on wooden pieces are used for rubbing rough surfaces smooth.

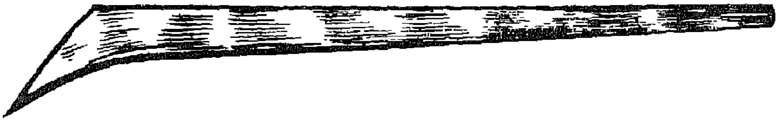
7. *Scissors*—For cutting tin, paper, card board etc, some good scissors are needed.

8 *Kettle*—It is used for baking colours as shown in the fig. 9. In order to keep the colours in liquid form they should be kept in hot water bath.

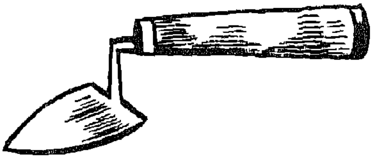
9. *Small cups*—China or glass or tin cups are needed for mixing colours and dyes,

Knives—Fig. 5





Nail Cutter—Fig. 6



Masons' Majhola—Fig. 7

WOODEN THAPKI

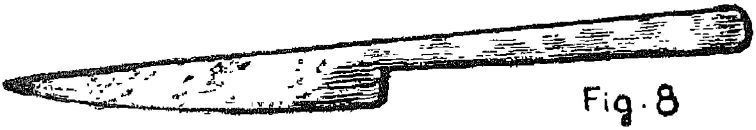


Fig. 8

KETTLE

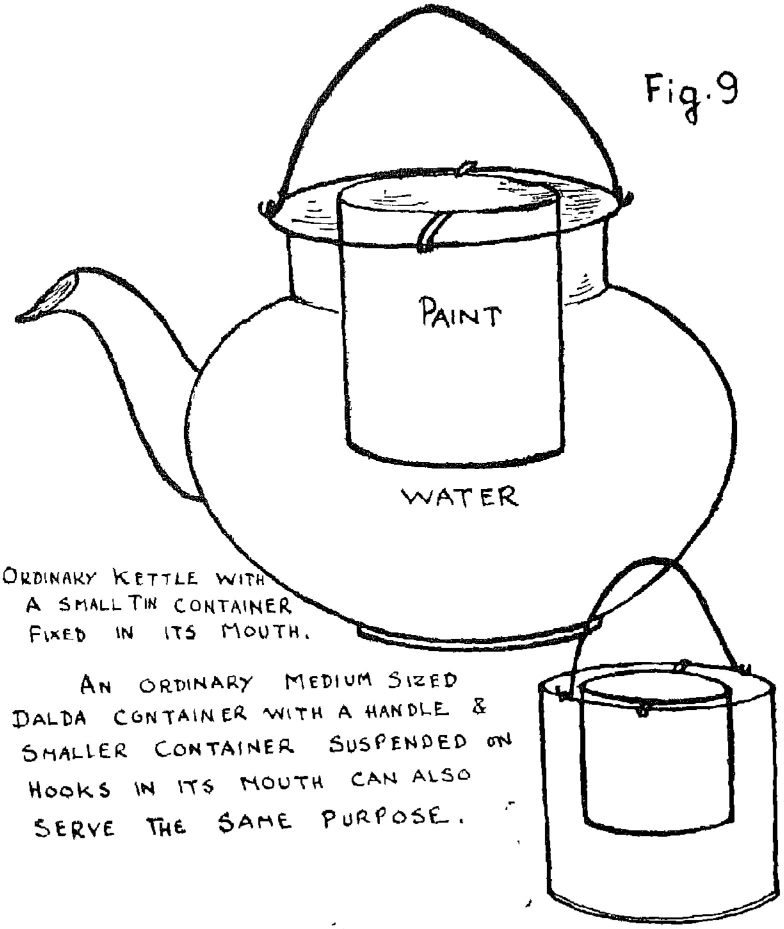
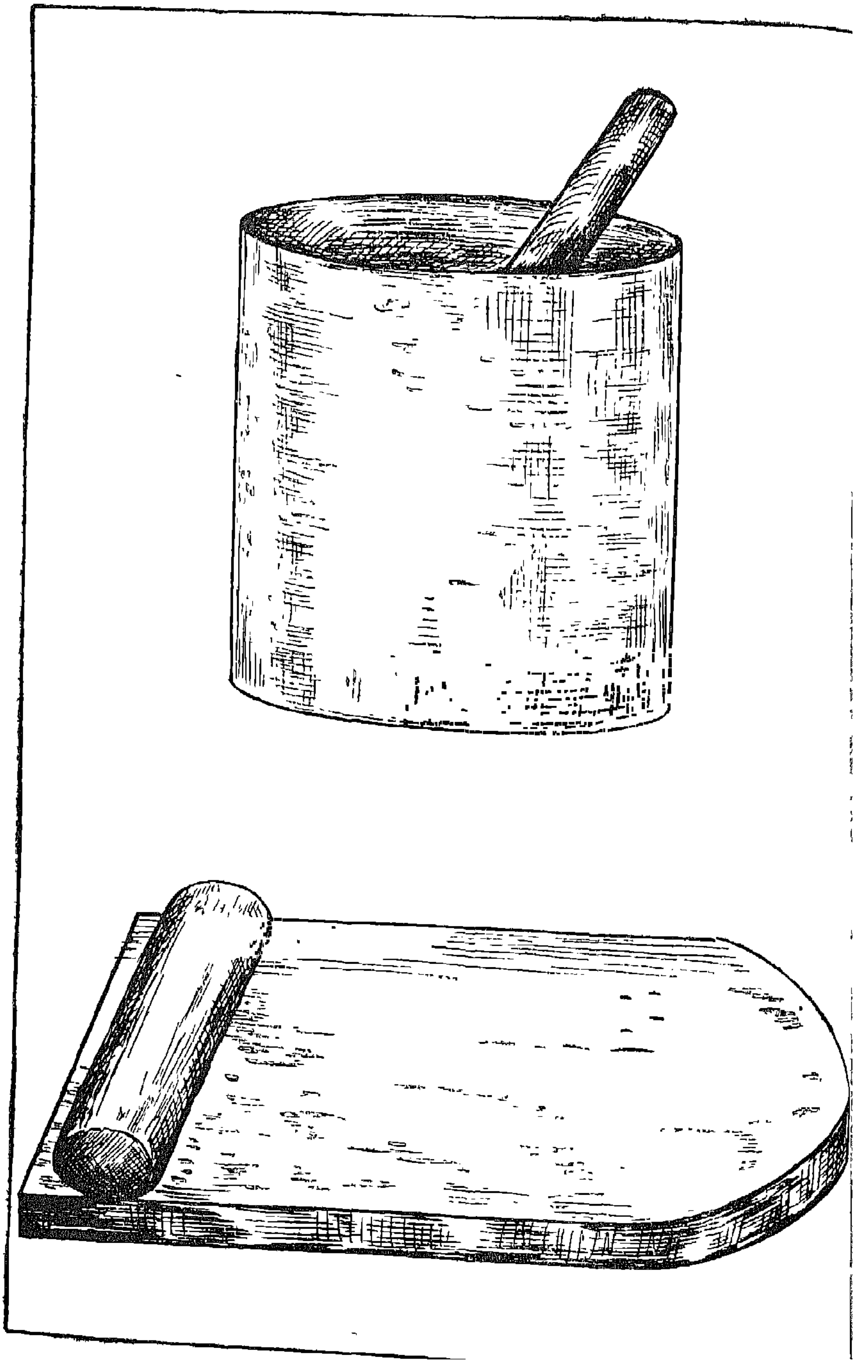


Fig. 9

ORDINARY KETTLE WITH A SMALL TIN CONTAINER FIXED IN ITS MOUTH.

AN ORDINARY MEDIUM SIZED DALDA CONTAINER WITH A HANDLE & SMALLER CONTAINER SUSPENDED ON HOOKS IN ITS MOUTH CAN ALSO SERVE THE SAME PURPOSE.



Pestle and Mortar—Fig 10

10 *Saw*—A small saw about one foot long is required for cutting the papier mache articles

11 *Stove*—An electric stove or an ordinary stove or even a 'desi angethi' is needed for heating and boiling purposes

12 *Brushes*—Ordinary brushes of different sizes are available from the bazar For young children camel hair brushes prepared by themselves will be more suitable For finer work in advanced classes hair brushes or squirrel hair brushes are recommended

13 *A set of clay modelling tools*—(This can be easily had from the bazar)

14 *Pestle and mortar* (Fig 10)

15 *'Sill and Batta'*—A flat rough stone slab is called 'sill' and 'batta' is a small round stone (Fig. 11)

Chapter VI

Designing for Papier Mache Work

WHAT DESIGNING MEANS

The word 'design' comes from the French word 'dessin', which means the decorative work of art Generally we take designs as the conventional type of art or decorating certain surface in an artistic way so that it may appear more beautiful and attractive Design is the key note to artistic craftsmanship for on it will depend whether the attitude of the child towards his produced article is vigorous and healthy or feeble and sickly. It is mostly through design that the artistic sense of children is aroused in the beginning and they are led to appreciate beauty in its several forms. Design is often confused with what is called ornament and very often puritans want to banish ornament and plead for the exclusion of design The design of a thing is the way it is made, the pattern into which the material has been cast, while ornament is the way in which we decorate it. The distinction will be clear if we consider that a thing can be really beautiful without ornament, but a thing cannot be beautiful without design. Many a thing covered with ornament looks ugly because it has no design

NEED OF DESIGN

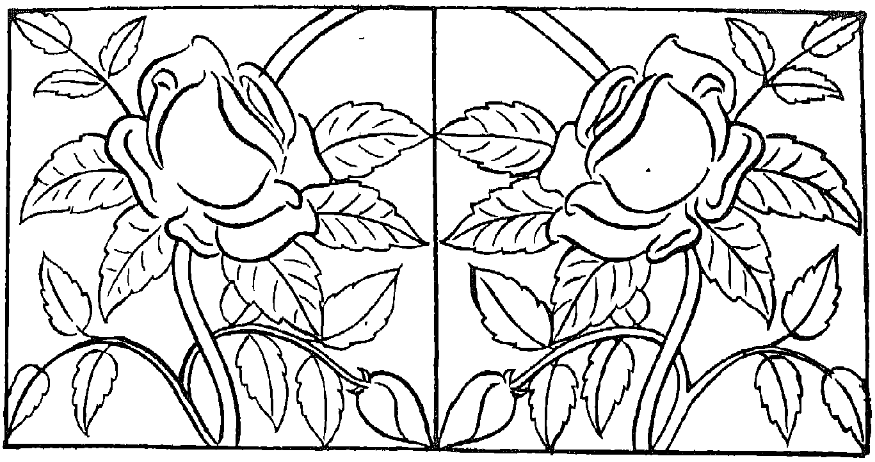
The object of designing is to provide opportunities to the child for the fullest expression of his personality. It is an effective way of free and creative self-expression. It brings out the artistic impulse of the child. It also forms an important feature in the development of the arts, industries and commerce of a country. In papier mache craft also it is necessary to prepare designs of the articles and the patterns for painting them.

MATERIAL

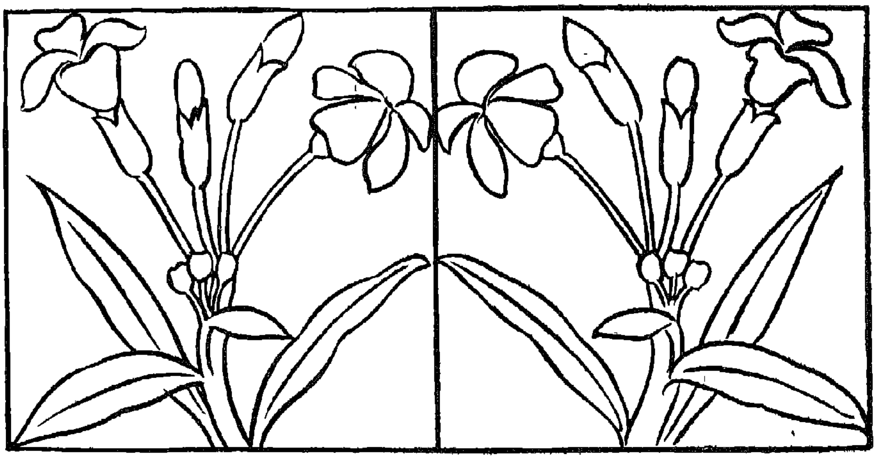
In the earliest days man started designing by combining dots, straight and curved lines, but with the advancement of civilisation plant forms, human, animal and other organic forms were gradually introduced and adopted to designing according to the taste of the pupil. Following are the sources from where material for design can be had:—

1. *Nature*—Nature provides with an enormous variety of designs.

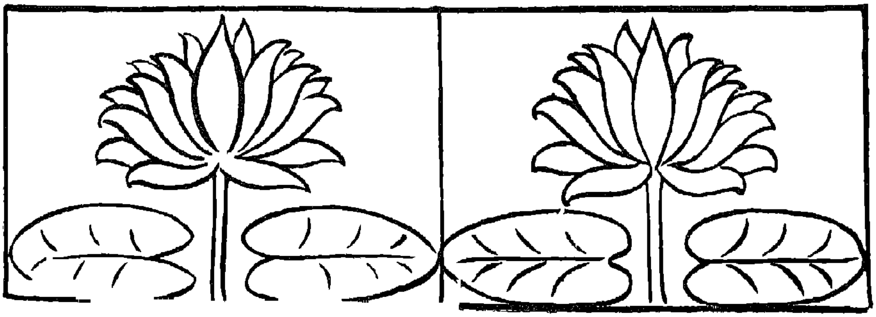
Rose Flower—Fig. 12



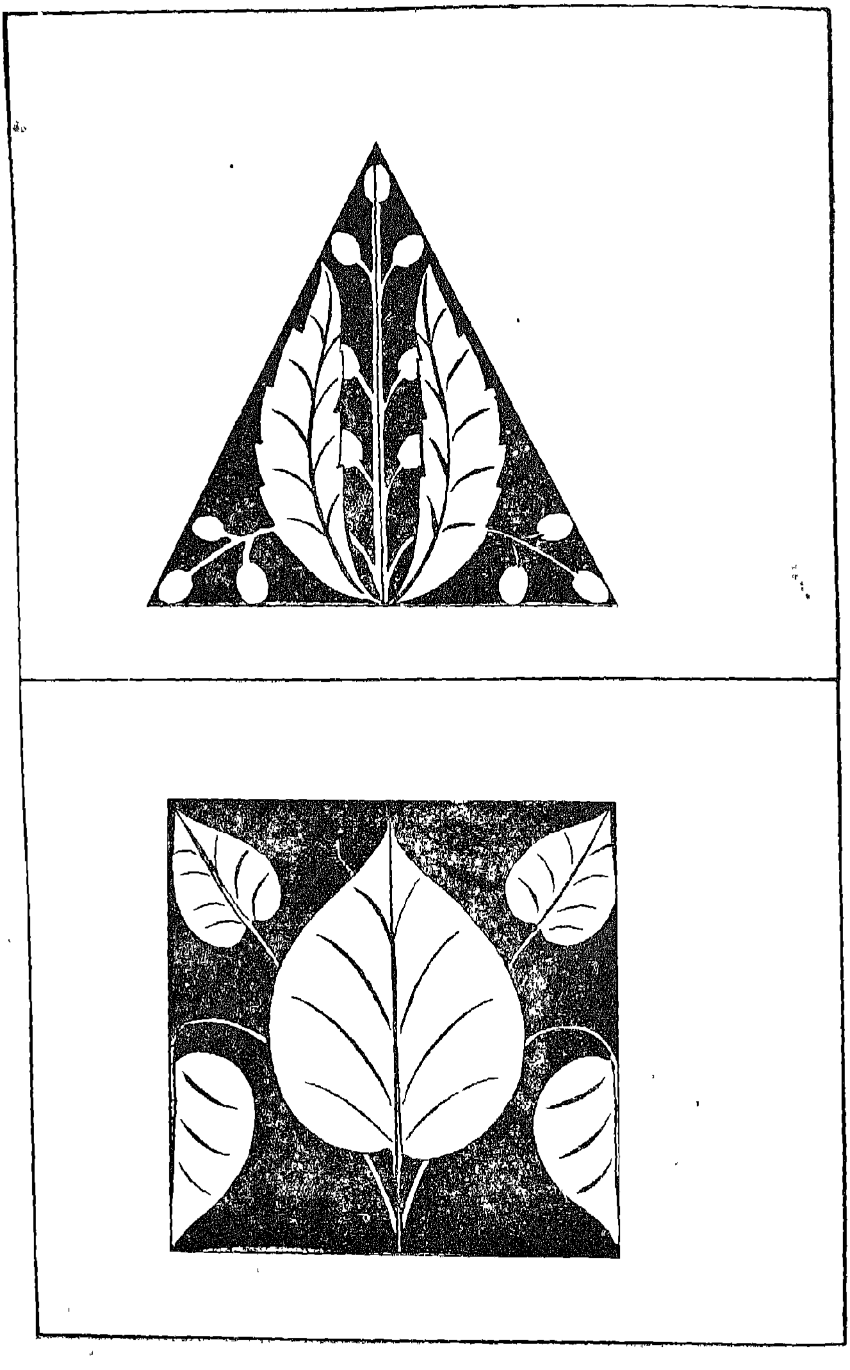
Wall Flower—Fig. 13



Lotus Flower—Fig.14

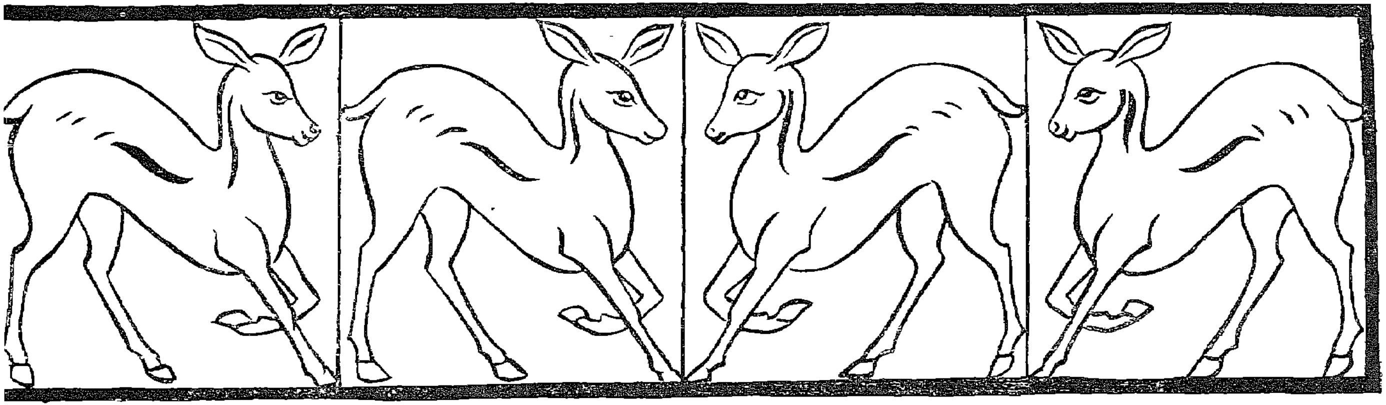


Environmental Design—Fig 15



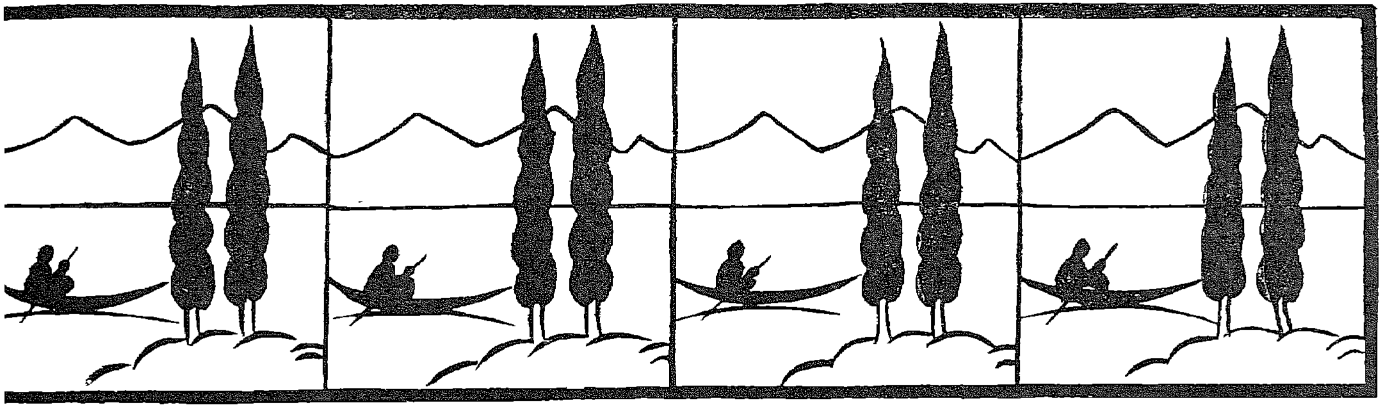
atural Design (Animal)

Fig 17



ature in Design

Fig. 18



Geometrical Patterns

Fig 19

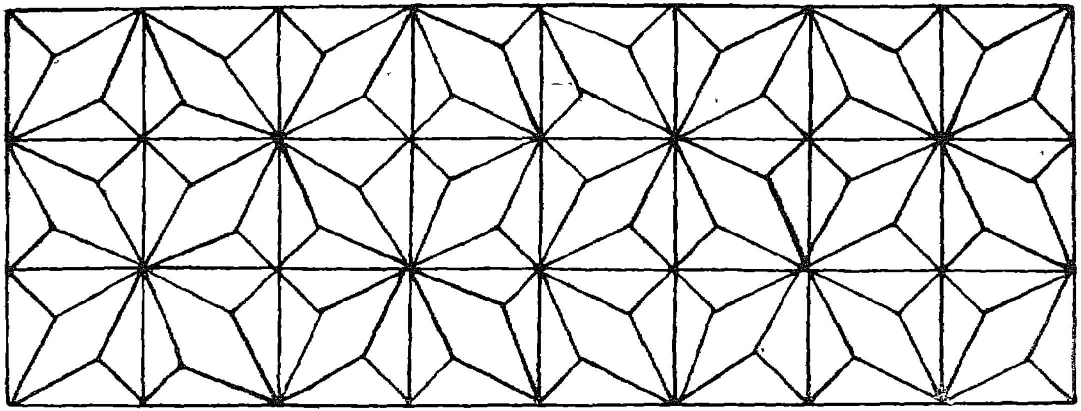
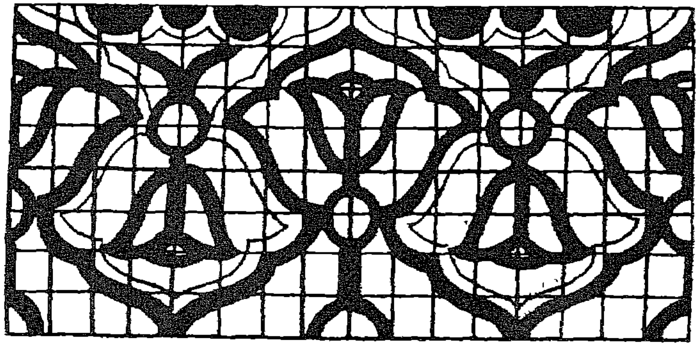
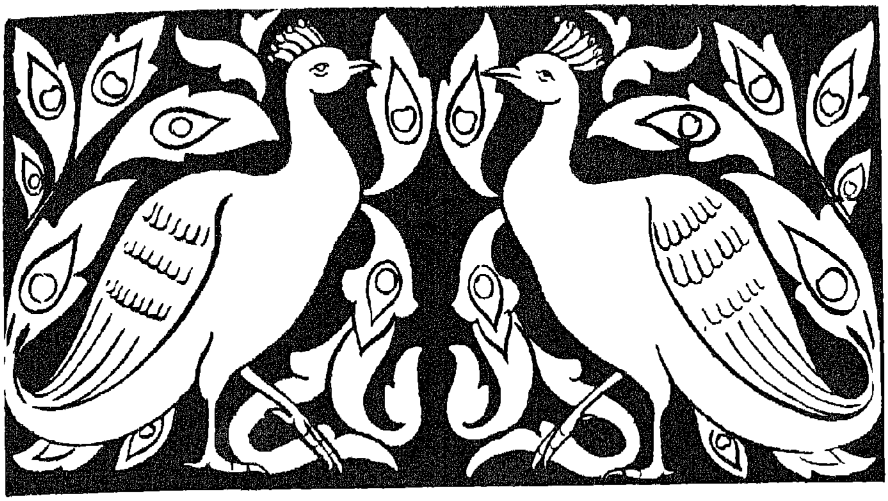


Fig 20



Reception

Fig 21



Alternation

Fig 22

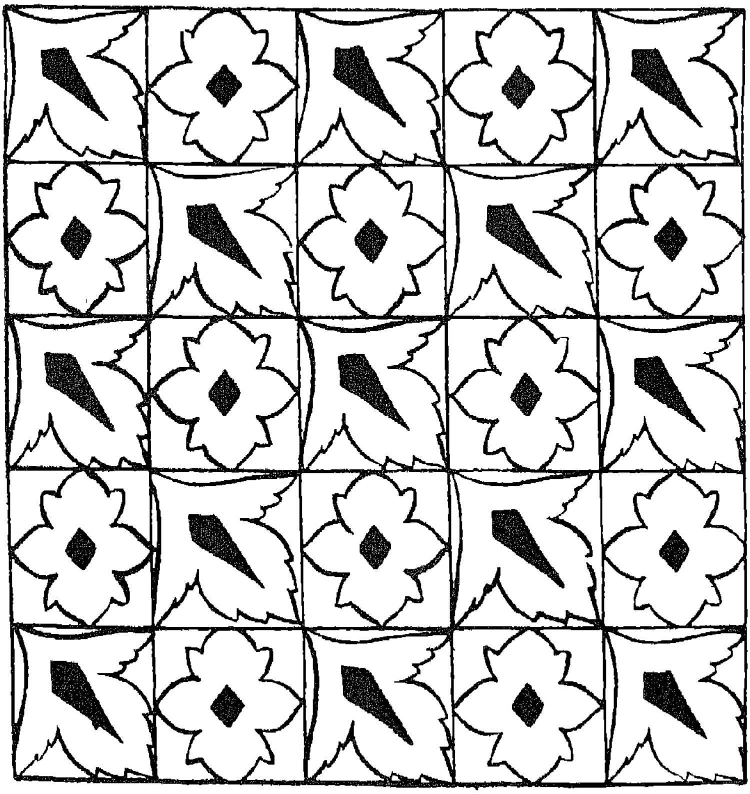
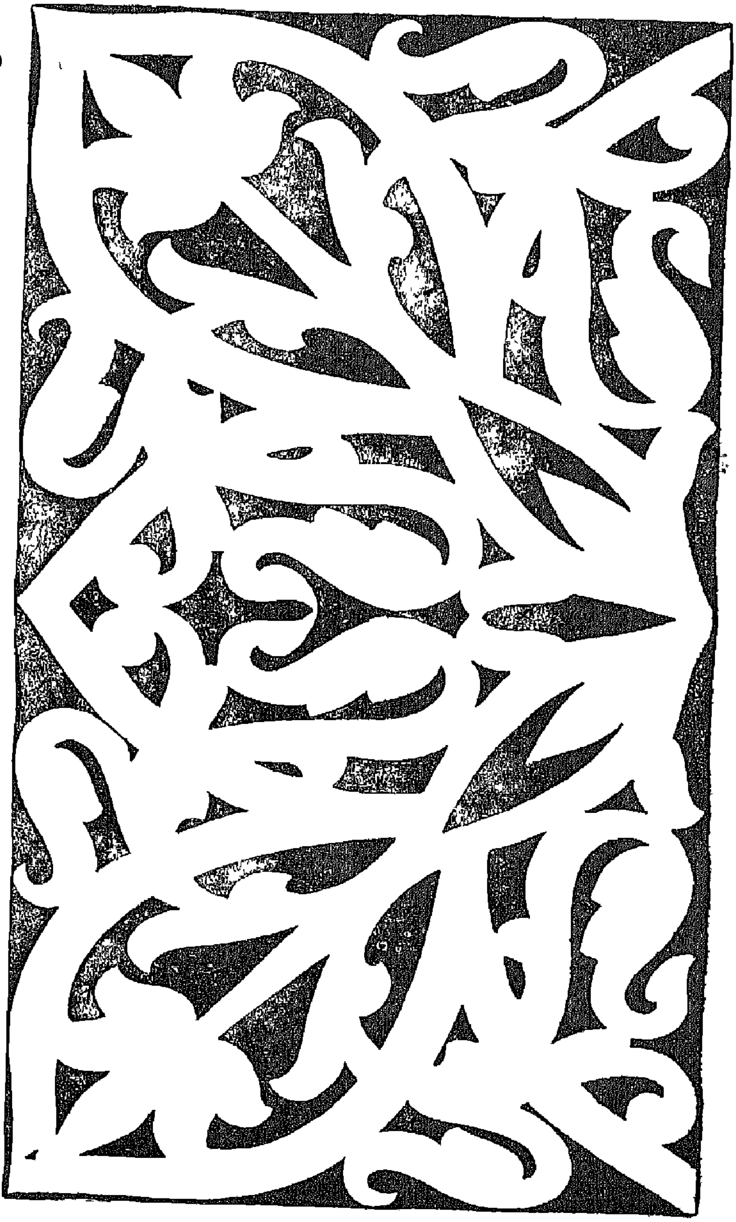


Fig 23



Symmetry

Balance

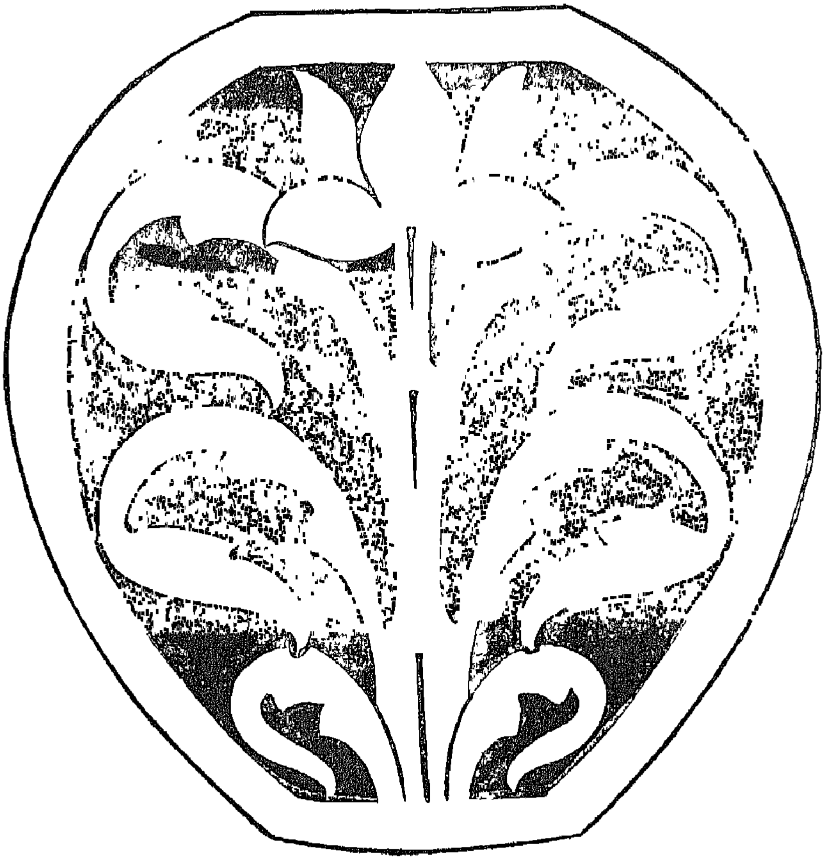


Fig 24

DESIGNING THE PAPIER MACHE ARTICLES

2 *Plant forms*—Plants, leaves flowers, branches, stems, trees etc., can be used as patters for designing with their original grace and beauty. (Fig. Nos. 12, 13, 14, 15 and 16).

3 *Animal and human forms*—Common birds, animals and people of different nations with their typical dresses can form motifs for designing (Fig. 17, 18).

4 *Geometrical forms*—Different geometrical forms such as a straight line, a curved line, a dot, a triangle; a square, a rectangle, a circle, a semi-circle and an arch separately or in combination can provide a very good material for designing. (Fig 19, 20)

5 *Organic forms*—Organic forms can be used for designing.

PRINCIPLES

For designing there are certain principles. It has a certain order, rhythm and system. The chief principles are:—

(i) Repetition,
(ii) Alternation,
(iii) Symmetry, and
(iv) Balance

In lower classes repetition type is mostly used. It consists in repeating one unit throughout the surface It makes the surface attractive and it is simple to construct. Small children can use it very easily. Patterns from a broken walnut, a button and a cut potato etc can be made and used for this kind of design.

Sometimes this type of design appears to be monotonous. To remove this two different pattern units can be used alternately as is shown in the diagrams shown in Fig. 21.

Symmetry (Fig 22) and balance (Fig. 23) also play an important part in designing. Symmetry imports beauty. So a child likes symmetry in designing. Balance makes the design attractive and pleasing to the eye Fig. 24 fully illustrates these points.

Chapter VII

Preparing Papier Mache Pulp

As already discused in Chapter IV, paper is the best material for the preparation of papier mache pulp Hence we take up here the method of preparing paper pulp.

Paper pulp commonly known as 'kutti' is prepared by beating the waste paper into pulp. The following processes are undertaken.

PAPER SORTING

It has been found by experiments that paper of different varieties and thickness behaves differently when soaked in water, e g, newsprint takes less time to soften than the wrapping paper and paper of exercise books takes less time than white printing or art paper. It is, therefore, essential to sort waste paper according to their varieties Paper of the same variety when beaten will give fine pulp If different varieties of paper having different thickness are mixed together and beaten they do not give homogeneous pulp Hence before soaking the waste paper should be sorted out into different varieties such as:

1 Examination answer books,
2. Exercise books,
3 Waste post cards,
4 Newsprint,
5 White printing,
6. Old registers,
7 Card board, and
8 Art paper.

Each variety should be put in a separate tin duly labelled The work of sorting can be entrusted to the young children who can classify them easily Children can even be trained for this purpose. Besides giving children training to recognise and differentiate between the different varieties, it will help in developing the children's various senses, such as, sight, hearing, touch, smell and pressure By sight they can observe the difference in texture, weight and quality of different varieties of paper. By smell and touch also they can differentiate between the various types of paper Varieties of paper can also be recognised through the sound produced while tearing paper. Thus, this simple process of sorting papers will go a long way to develop children's power of observation and give them an opportunity to train their senses

TEARING OR CUTTING

After the paper has been sorted into different varieties, it should be torn or cut into small pieces not more than one inch on either side. This process involves no skill and hence is easy for young children. Moreover, it will be very interesting for children as it provides a safe channel for their destructive instinct. It will keep them busy in this playful but useful activity. The smaller the pieces, the less time they will take to soften. The pieces should be thoroughly dusted to remove dirt

BOILING OR SOAKING

Each variety of paper should be separately soaked in water For this purpose we may either have tins, earthen pots with open and wide mouths or cemented soaking pits

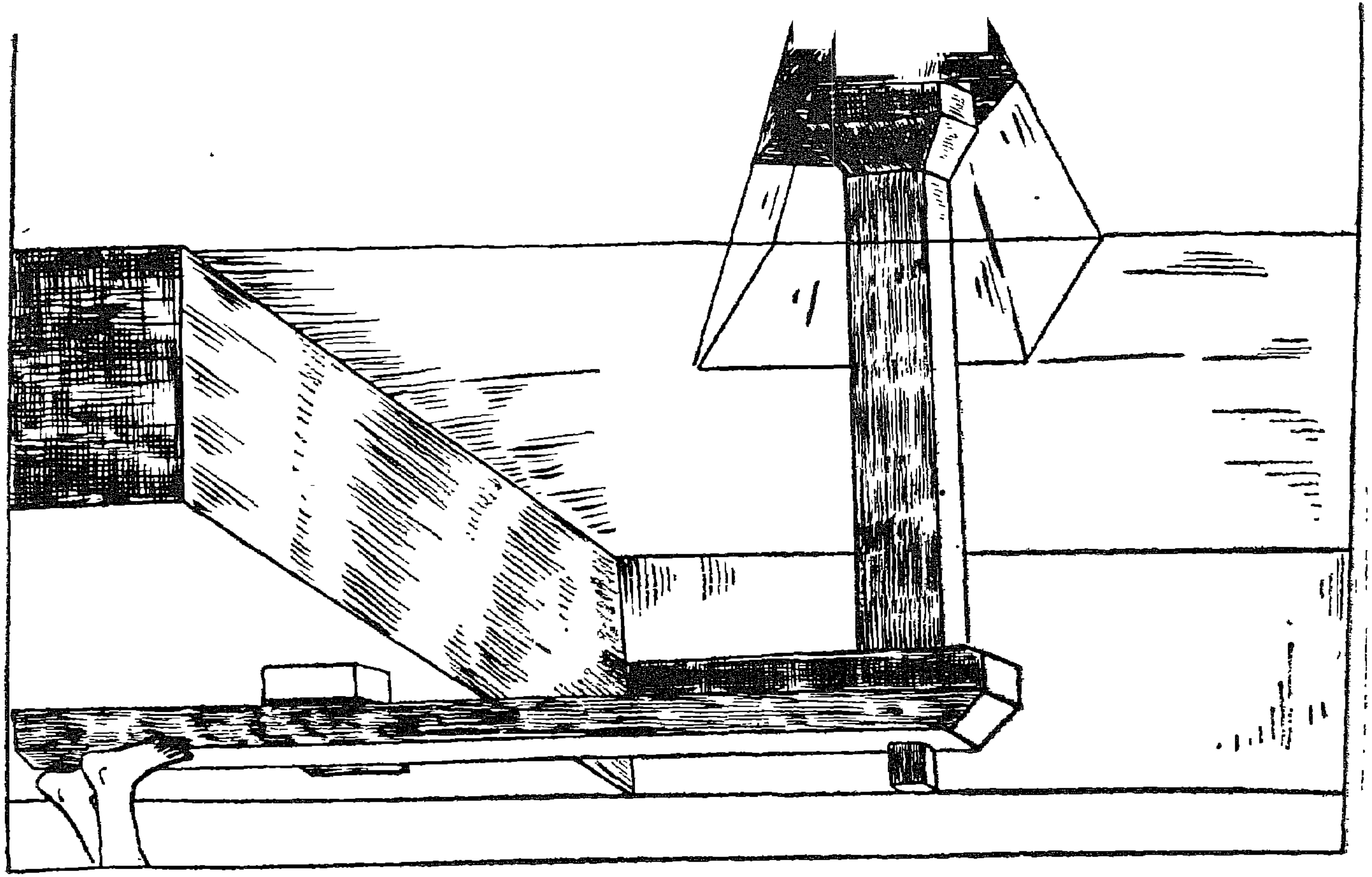
Soaking Pits

Cemented soaking pits are recommended. It would be better if these pits are constructed on raised level (3 feet from the floor level) The dimensions of a pit may be 2 feet × 3 feet × 2 feet. A water tap near or above the pit would be very helpful While soaking paper care should be taken not to mix two or more varieties in one pit.

Water

Sufficient quantity of water may be added so as to cover the paper completely. Water should stand at least two inches above the level of paper Water in the pit should be changed and the pieces of paper should be stirred after every twelve hours to avoid stinking. Ordinary paper soaked for one week yields good results even without chemical treatment

If, however, the articles are required to be prepared in less time, paper pieces may be treated with some alkali—caustic soda solution 4% or soda ash solution 6% The paper pieces should be put in an earthen pot and dipped in sufficient quantity of solution of washing soda or 'sajji' The quantity of alkali should be 4% to 5% of the raw material The pot should then be put on fire for boiling After boiling it for about one hour the kettle should be taken down the fire and



kept for about 24 hours The water then should be drained off and paper pieces should be thoroughly washed till alkali is completely removed.

BEATING OF PAPER

Paper is required to be beaten into fine pulp for use in papier mache Any one of the following methods can be employed for this purpose :—

(i) *'Okhali-moosal'*—A wooden 'Okhali' (rice pounder) and a wooden 'moosal' are generally used in Indian villages for husking rice, hence there will be no difficulty in getting them for beating paper. The soaked paper is beaten in the wooden 'okhali' with the 'moosal' This method requires less time and is easier to do An improvement can be made by having a stone 'okhal' and 'moosal' with a steel rim fixed at the end.

(ii) *'Koondi'*—If the quantity required is not much a stone 'koondi' and thick wooden club can be used. An iron mortar and pestle can also serve the purpose.

(iii) *Stone 'Sill Batta'*—A flat stone slab known as 'sill' and a round thick stone (batta) are used in some parts of India for grinding purposes These too. can be used for beating paper into pulp. This method takes longer time but is easier and less tiring. The results obtained are quite satisfactory

(iv) *Dhenki* (Fig. 25)—For large scale industry of papier mache, 'Dhenki' should be used for beating paper into pulp

(v) *Trampling Pits*—A semicircular cup-shaped pit made either of cement concrete with rough inside plaster or of rough stones, with a mouth 24 inches in diameter and 10 inches to 12 inches deep is constructed In this pit the soaked paper pieces should be trampled under feet by children and then rubbed on rough floor or 'sill' with a 'batta' to reduce into homogeneous and fine pulp

Beating processes involve sufficient amount of physical exercise especially for muscles of arms and of chest and legs. It provides a good exercise for stomach also. Children can very safely be employed in this activity.

Chapter VIII

Use of Moulds

Moulds are needed for casting papier mache articles in any method, whether Western, Jaipur or Kashmir There are different kinds of moulds We can classify moulds into following types,

1 *Solid Moulds*

These moulds are used in Western and Kashmir methods, where layers of paper or papier mache are to be applied on the outer surface. After the setting of the layers and completely drying of the articles, they are removed as a whole or by cutting them into parts according to convenience. Decorative pieces, toilet boxes, trays, table lamps, lamp shades, powder cases, ink stand, flower vases etc, are generally prepared by this method.

These moulds may be made of clay, Plaster of Paris, some suitable metal or wood. They can be prepared in schools in the clay modelling class or in the wood work class or they can be got prepared from some skilled persons in the bazar at a cheap rate. It would be better if the clay moulds are baked in the potter's kiln or in the school itself in fire of the dung cakes These moulds are generally used in Kashmir process.

2 *Improvised Moulds*

Some actual objects such as flower vases, 'katories', tumblers, plates, trays, balls, toys, utensils, boxes, earthen wares, glass vessels (even broken) etc, can very conveniently be used as solid moulds According to the need two or three solid moulds can be used for preparing one single article of papier mache, e g., a pedestal electric lamp can be prepared by using a steel pipe to cast the rod, a wash basin for casting the base and the base of some round earthen jar can be used for preparing the shade

Improvised moulds can provide a large variety for every taste They can easily and cheaply be purchased from the toy shops and the "kabaria's" shops. They can also be borrowed from some friends as they are not liable to be spoiled in use. The teachers should prepare a list of such articles which can be used by the classes for this purpose A resourceful teacher can, with a little effort, make a collection of such objects by encouraging the pupils to bring to school some broken articles and toys which are generally thrown away as waste and worthless.

3 *Hollow Moulds*

Hollow moulds differ from the solid moulds in that in hollow moulds the papier mache layer is put inside the mould, while in a solid mould the papier mache is laid on the outer surface. The hollow moulds are generally made of Plaster of Paris or clay Wooden moulds can also be prepared by carving and engraving which is possible only by the experts in that art The schools can prepare two piece moulds of clay and Plaster of Paris Moulds of clay can be baked in the potter's kiln or in the fire of the dung cakes.

Making of moulds requires some skill in clay moulding and modelling

MATERIAL NEEDED FOR MAKING MOULDS

1. Solid models prepared of clay, or some actual articles such as fruits, vegetables, toys, plates, etc Even some improvised models selected from some waste and broken articles can serve as solid models
2. Wooden frames of different sizes (brick frames) according to need.
3. Potter's clay.
4. Plaster of Paris.
5. Chalk.
6. Greeze or Oil.
7. Double edged knife and a nail cutter.
8. Water.
9. A table with a revolving top.
10. A set of clay modelling tools

Processes

PREPARATION OF MOULDS OF CLAY

Kneading

Potter's clay should be kneaded thoroughly in water The test of finely kneaded clay fit for use is that it should not stick to the fingers. It should be sufficiently solid.

Modelling

Put the lump of clay on the revolving disc. Mould this clay with fingers and hands so as to give it shape of the model required to be prepared. When it gets a little dry the details should be cut with the help of clay modelling tools (a knife or a nail cutter) according to need. As it requires some skill, cutting of details cannot be handled by the beginners However. the school can make some arrangement for giving some reparatory lessons to the pupils in sculpturing When the details have been completely drawn out then take a squirrel hair brush, dip it in water and brush the whole model. This will remove extra clay and will give it a smooth surface. Now leave the model to dry.

Young children can prepare easier models of objects like fruits and vegetables. Though the real objects can serve as models for moulds, yet in order to give children some practice in handling and moulding clay, they may be asked to prepare some simple models Again these models will be helpful and useful when fruits and vegetables are out of season.

It would be better if the models are baked They will become more lasting and can be used by children in other classes It facilitates their storing and avoids breakage and waste

PREPARATION OF MOULDS OF PLASTER OF PARIS

Take either clay or Plaster of Paris or cement of good quality and before dissolving it in water, test its water absorbing capacity which can be done in the following way:

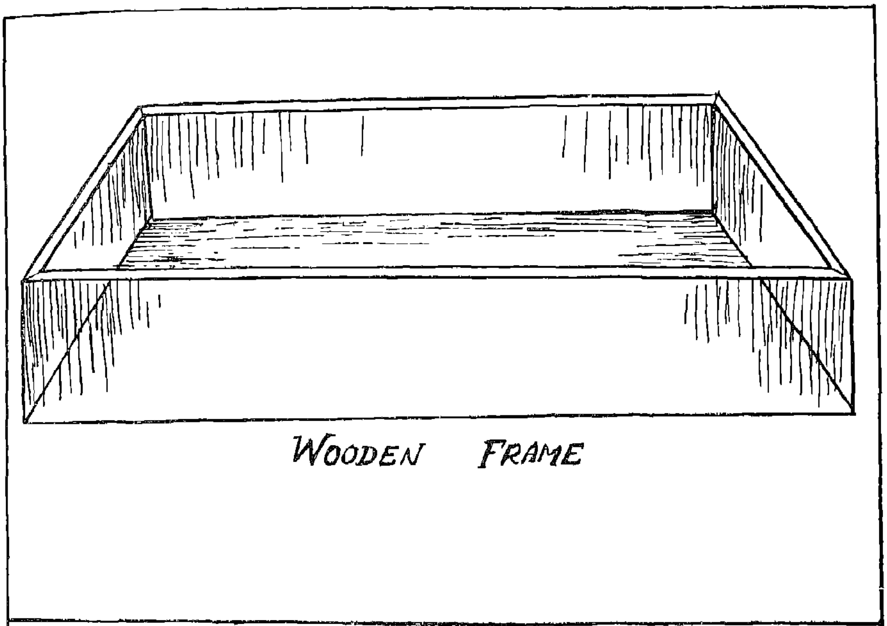
Have a small measure It may be a small tin or a cup. Put one tin full of Plaster of Paris in a basin and add sufficient water using the same measure. Go on mixing it with hand till paste-like solution of the required standard is obtained. Count the number of tins of water added. This will give us the standard ratios of water and Plaster of Paris This generally ranges from 1 3 to 1·5

Now place the wooden frame on the table (Fig 26) Put a layer of thick chalk solution about ½ inch in depth. This thickness of the layer of chalk will vary according to the thickness of the model (Fig 27). Now put the model with its face upward just in the centre of the frame. Mark the middle line of the model. Now cover this half portion of the model with thick chalk solution (Fig 28) The upper surface of chalk must be made even to secure better results. Now apply greeze or oil on the surface of chalk and the model. This facilitates the removing of the model from the mould Prepare the solution of Plaster of Paris or clay according to the ratio as determined in the process given above

Now pour this solution into the frame upto its edges (Fig 29) The Plaster of Paris will set in about 10 to 15 minutes Turn the frame upside down. Remove the chalk with the help of a sharp blade or knife. Again apply greeze to the model and the surface of the

Making a Mould from Plaster of Paris

Fig. 26



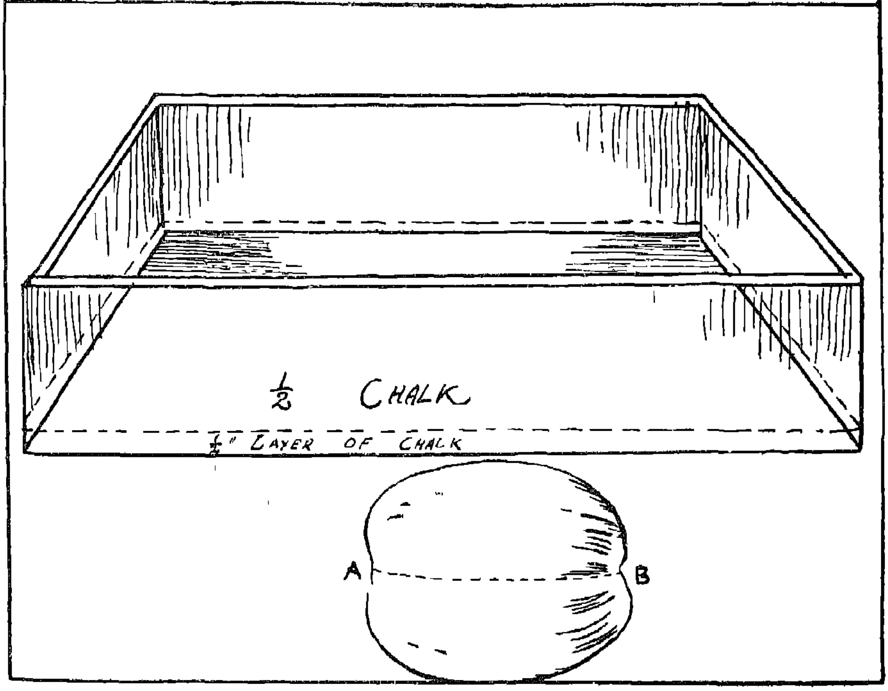
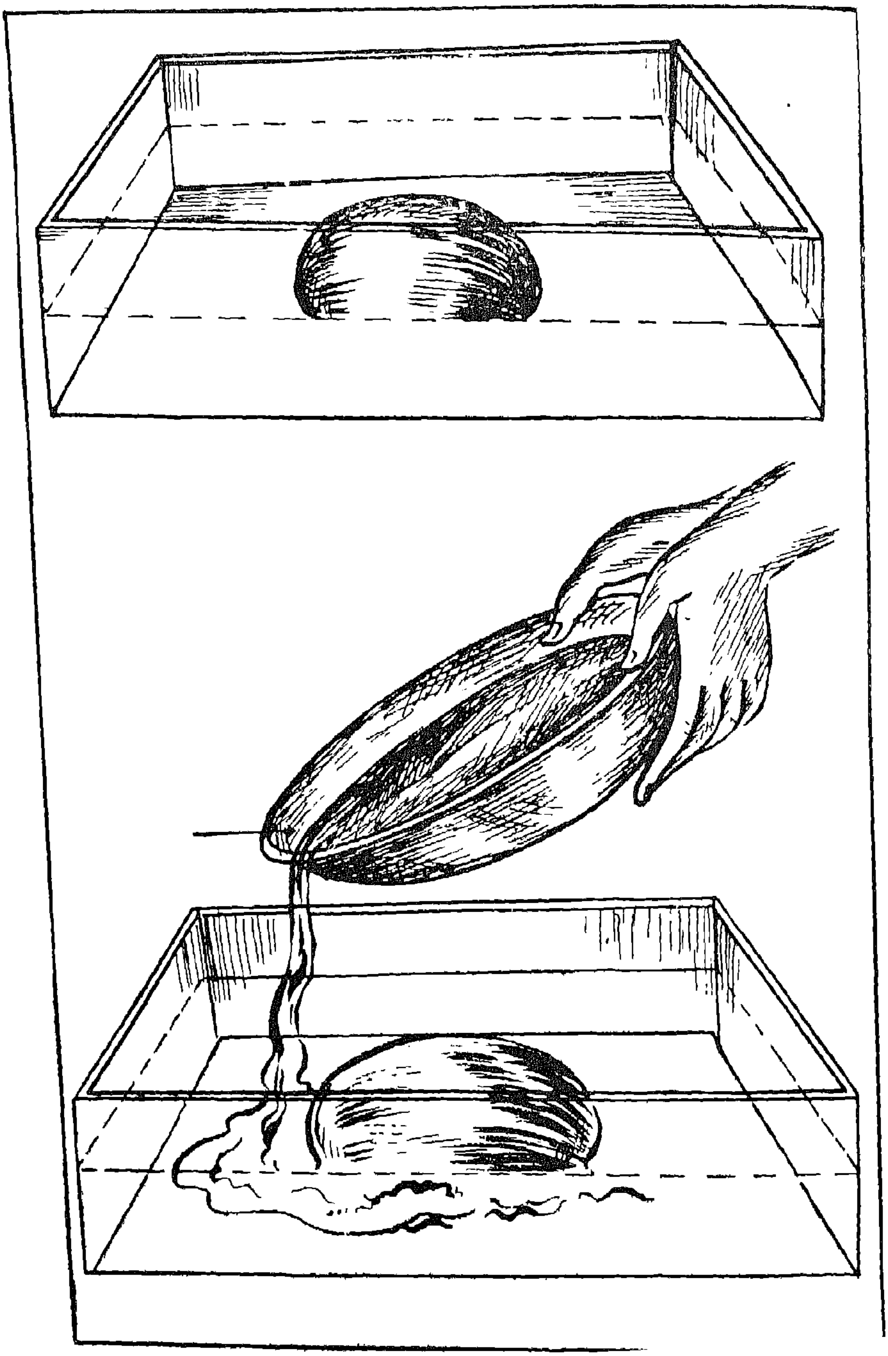


Fig. 27

Fig. 28



Plaster of Paris already set and pour Plaster of Paris in it upto its edges On its setting the mould is taken out of the frame in two separate pieces The mould is now ready for use

Hollow moulds are most suitable for making human figures, fruits, vegetables, birds and animals and thus they are mostly used in Jaipur method. For different parts different moulds should be prepared, such as in the case of human body the moulds for head, trunk, legs and arms will be required separately

Moulds of clay can also be prepared by the same process They must be baked in potter's kiln

MOULDS OF CEMENT

Moulds of cement can also be prepared in the same way as we prepare moulds of Plaster of Paris Cement and sand may be mixed in the ratio of 1:3

Chapter IX

Casting and Finishing

CASTING—ITS MEANING AND PURPOSE

Casting means to give a particular and proper form or shape to a plastic or a liquid solution by pouring it into a mould and letting it harden Papier mache takes the proper and attractive shape of the desired article in the moulds through casting. This is a very simple process which children can learn with a little practice. The child has not to think of the details of the designs of the article. He need not be a skilled artist to draw out the details as is necessary in clay modelling and pottery. The moulds are prepared in the set designs by a skilled person The process of casting is very economical and easy It does not take much time. Casting in the hollow moulds does not take more than 5 to 10 minutes and casting on the solid moulds takes 2 to 4 days for setting of the papier mache. Children receive training in producing articles at a commercial scale. Besides being simple this process provides satisfaction to the child, as he can get the desired articles in a beautiful design with full details ready in a short period, children get much joy to see that they have converted a lump of papier mache into some meaningful, useful and good looking article

PROCESSES

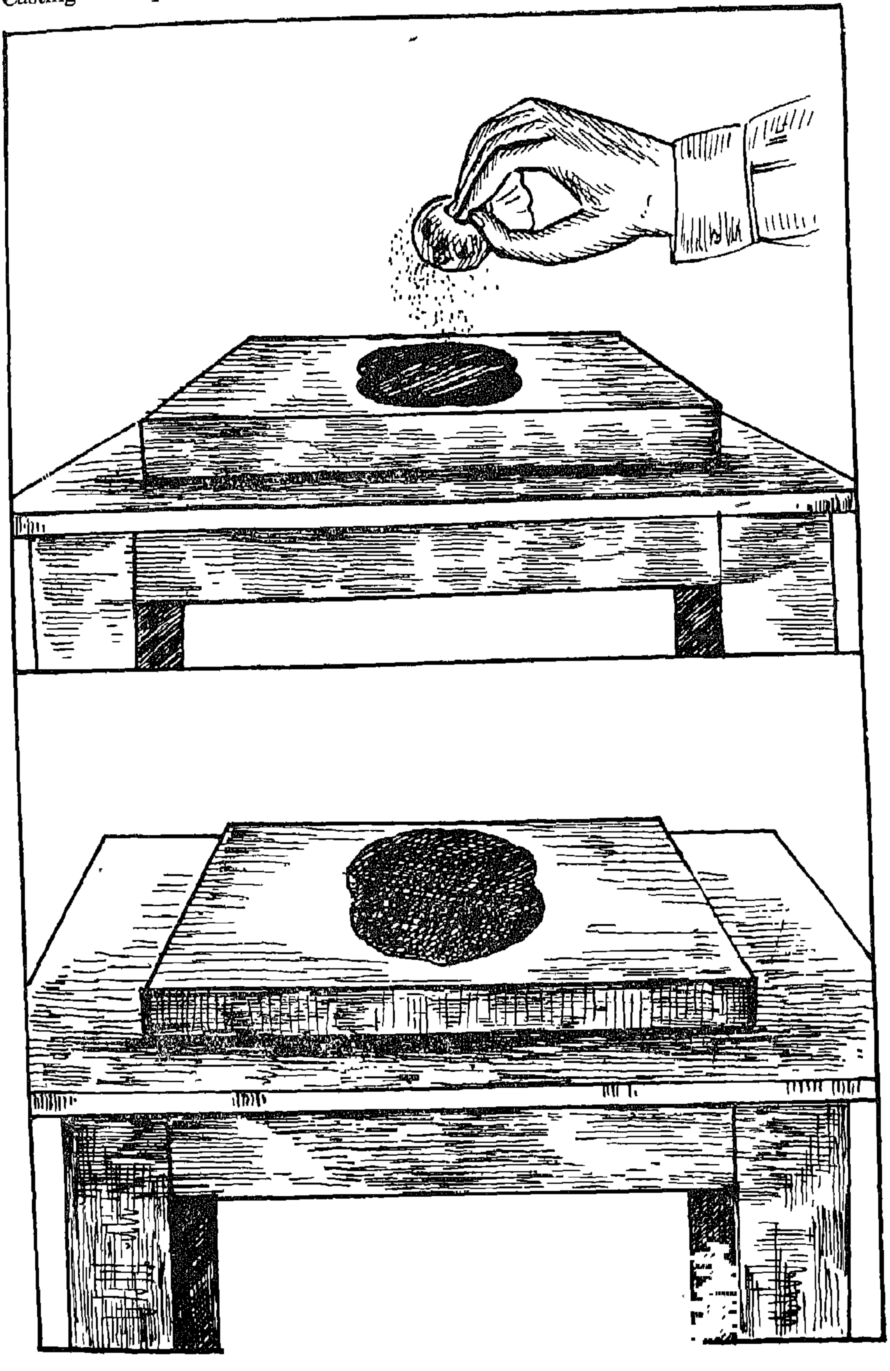
Jaipur Method

I Step· Place one half of the mould on a flat table, sprinkle some pulp thinned with water into it to fill up the crevices and corners It will help in bringing out the fine details on the object prepared. Fine powdered ash can also be dusted in place of pulp For this, ash is tied in a piece of thin muslin cloth. Take care that the ash is evenly sprinkled (Fig ·30) Wet muslin cloth can also be used for removing the article from the mould easily The wet muslin cloth is spread over the mould before pressing the papier mache into it

II Step· Take papier mache prepared for casting in the required quantity Flatten it in the shape of a chapati on a wooden board with a rolling pin (Fig 31). Press it with finger tips into the mould (Fig. 32). The processes should be repeated in the second half of the mould. Bring both the parts together so as to form the complete object (Fig. 33).

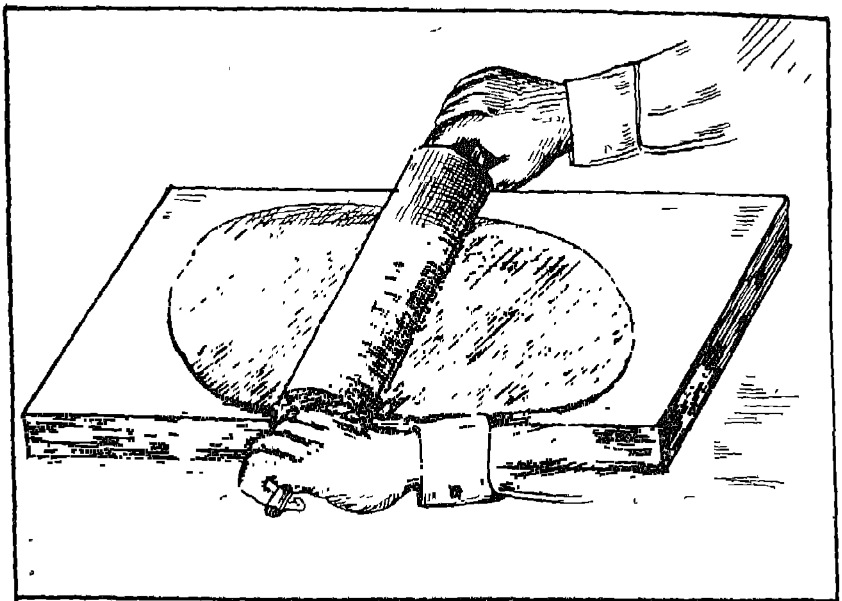
Casting in Jaipur Method—I Step

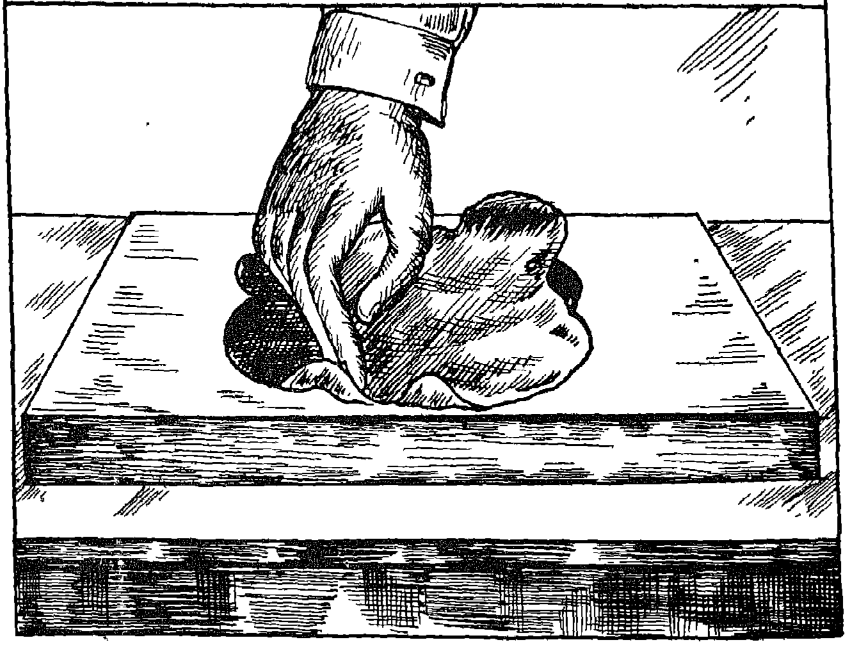
Fig. 30



Casting in Jaipur Method—II Step

(i) Flattening the Papier Mache Fig 31

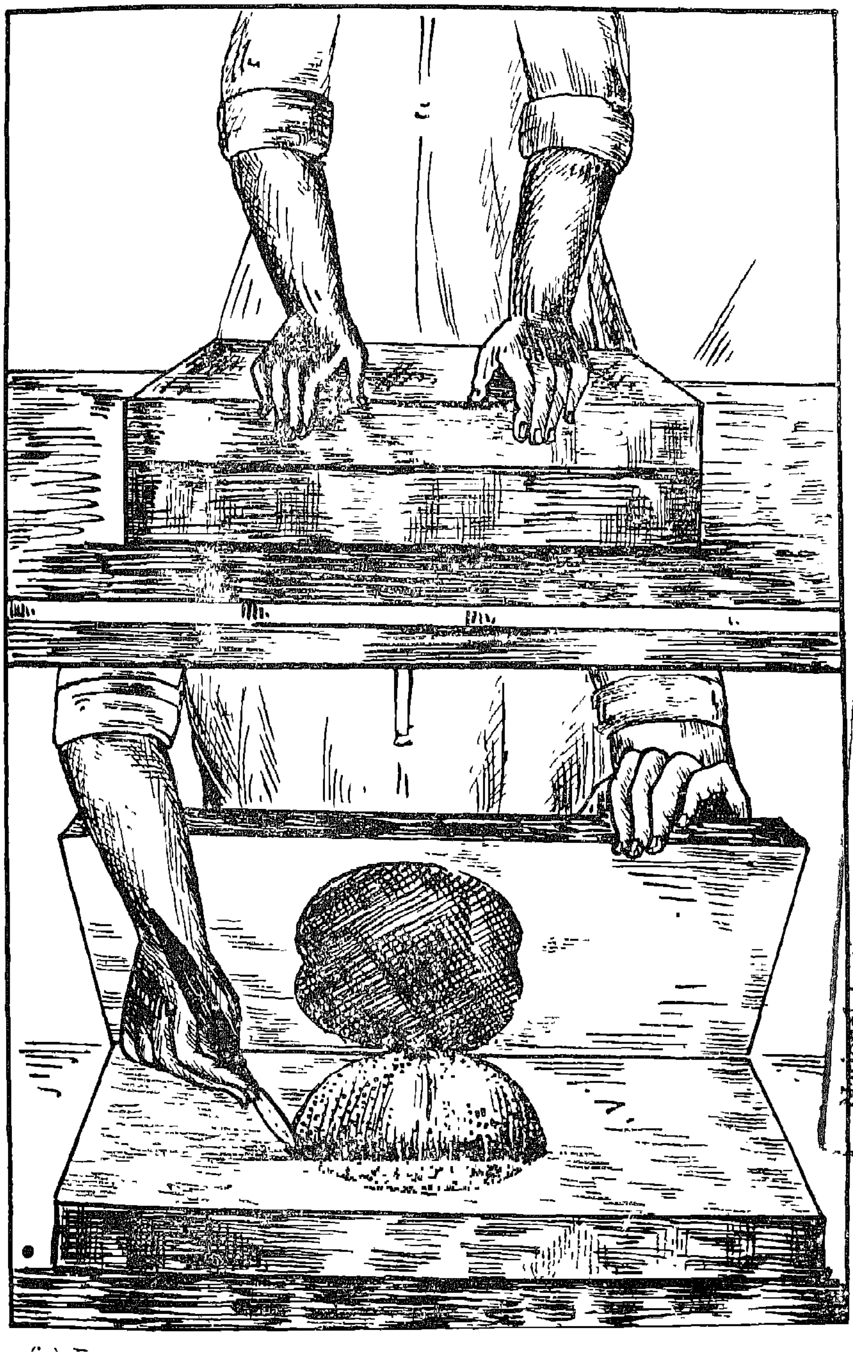




(ii) Pressing Papier Mache into the mould Fig 32

(iii) Bringing two parts together

Fig. 33

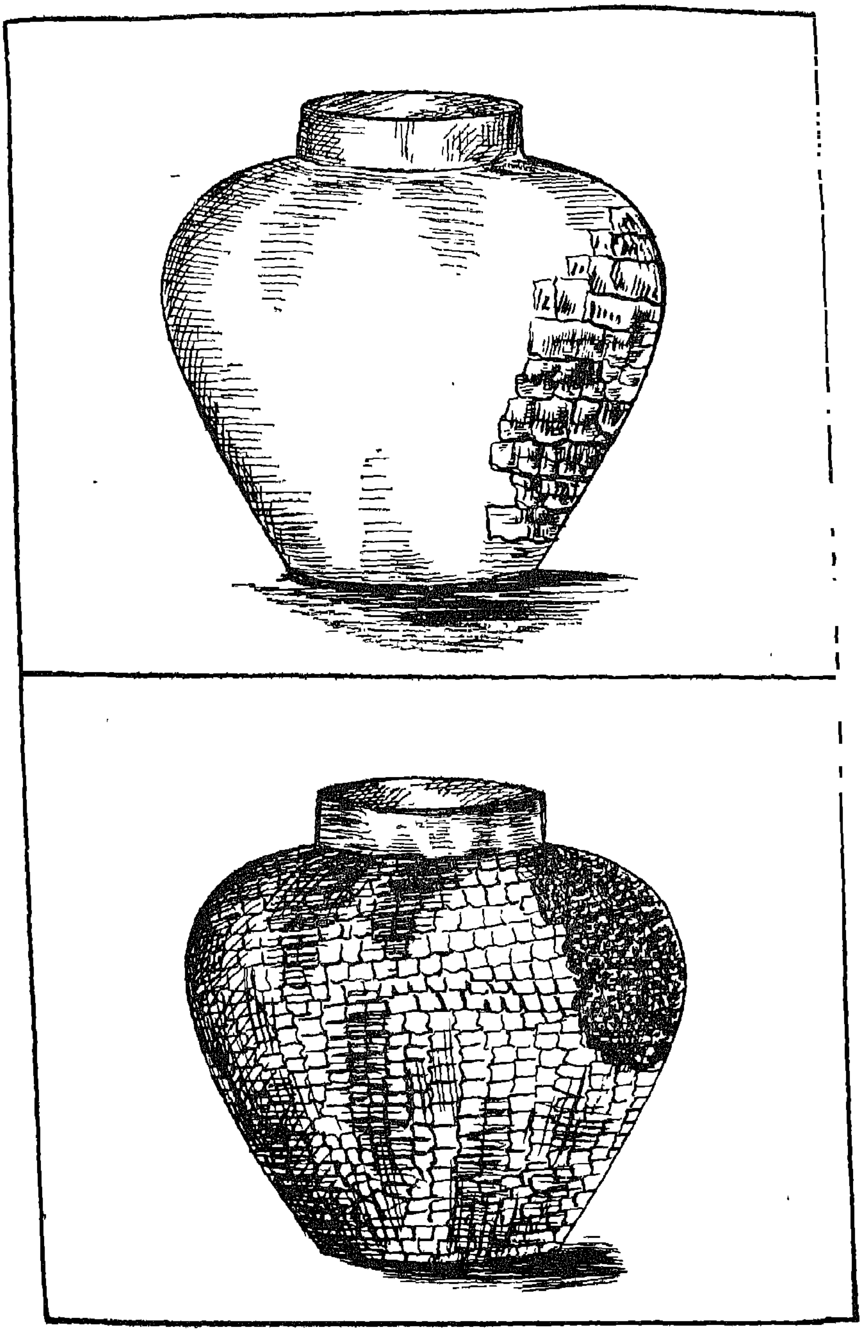


National Institute of Education

Casting Kashmir Method—1

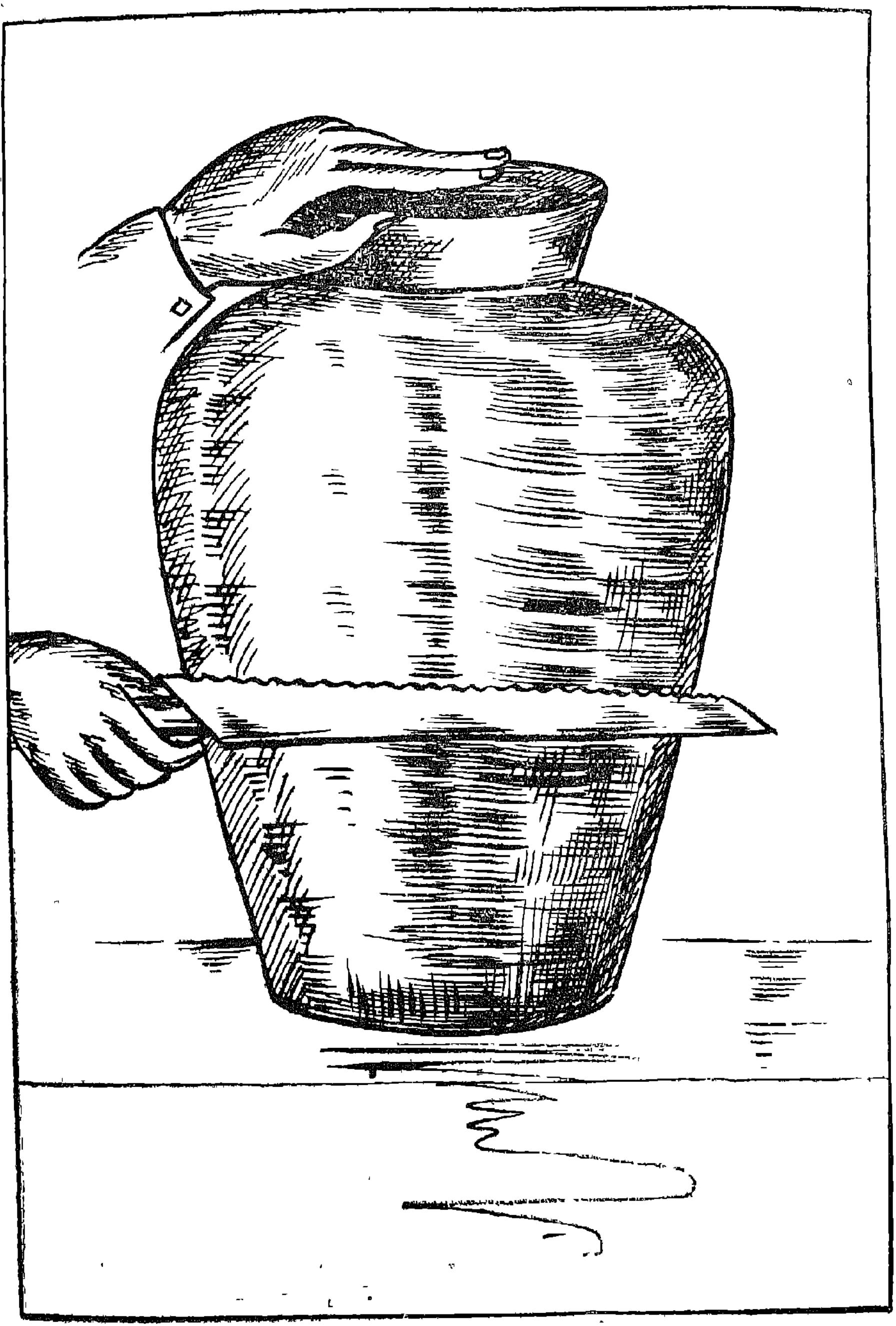
Pasting wet paper

Fig. 35

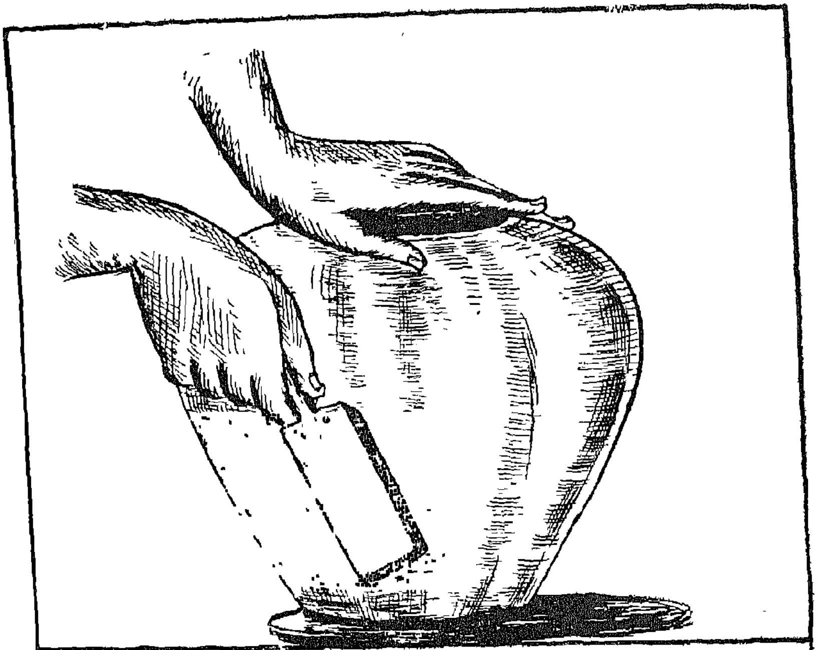


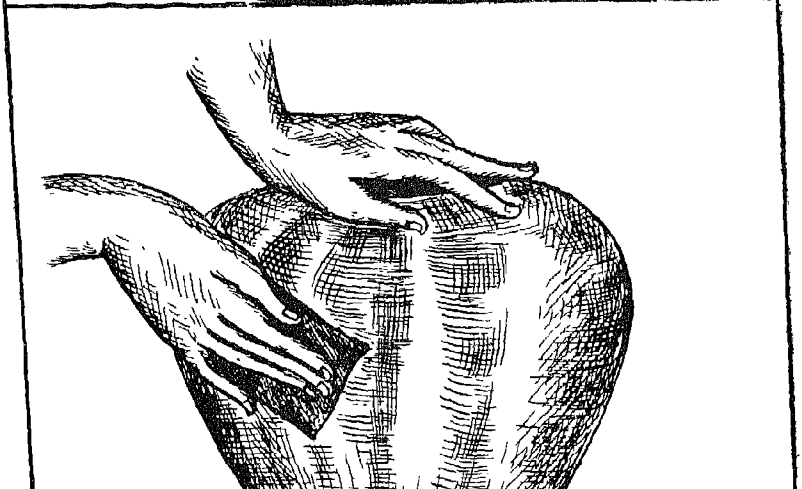
Casting in Kashmir Method—2

Removing the model off the mould Fig 36



Finishing—Smoothening with sand paper No 1 Fig 37





Finishing—Smoothening with sand paper No. 2 Fig. 38

Press them hard and then take the article out (Fig 34) The object is ready. If any object has been prepared in separate parts for joining these parts, use tin or wire with the kind of papier mache prepared for joining.

Tin plates are used for making the tails and beaks of the birds while wires can be used for making claws, legs, etc.

Kashmir Method

Take a solid mould and cover it with one layer of paper pieces of any convenient size with the help of water only (See Fig 35). Now apply papier mache prepared from rice starch or paste Leave it for one day. On the next day beat the outer surface with a wooden 'thapki' This will set the pulp on the mould Allow it to dry for 4 to 6 days, according to the size of the article prepared and the amount of pulp used

It is suggested that better results can be obtained if, in place of beating with a 'thapki' the surface of the article is smoothened by rubbing and pressing it with a 'majhola' (a flattened conical shaped iron piece with a wooden handle, used by masons for plastering) Repeat this process after four days when it is semi-dry, filling in the uneven spaces, if any, with fresh kutti. Remove it next day from the mould. If it can not be easily removed, cut it with a saw or a sharp knife (Fig 36). Afterwards join the pieces with glue solution.

When the articles have been removed from the mould remove the paper pieces and put the articles again on the mould (in case of single piece articles only) and keep them there for a day This gives the articles a good setting and minimizes the chances of shrinkage

SHAVING AND SMOOTHENING

Jaipur Method

The article, on getting dry, shrinks to some extent. This spoils the actual shape of the article. There are some depressions and projections. The outer surface becomes uneven To make it smooth and to give it its correct shape shaving is employed. It consists in applying papier mache specially prepared for this purpose as discussed in Chapter IV The article is given the proper shape with the help of thumb and finger tips This process needs some skill in modelling The article should again be left to dry for two or three days.

When the article is quite dry its surface should be rubbed with a sand paper No. 0 till a smooth surface is secured. Projections, if any, should be removed by rubbing sand paper No 1 (Fig 37).

Kashmir Method

In Kashmir Method there is very little possibility of shrinkage. Hence shaving is not needed. However, solution of Plaster of Paris is applied inside and outside the article with a brush. When it dries up, it is rubbed with a stone known as "gash" or 'jhawan'.

The article can be smoothened by pasting one layer of butter paper with the help of glue Care should be taken that the surface obtained is even On drying, rub it with a sand paper No. 2. (Fig. 38).

Western Method

In Western Method the process is more or less the same as in Kashmir Method. In this case also shrinkage is not much.

Chapter X

Decorative Work

Decorating the papier mache articles is the next step after casting them It involves designing, painting and finishing Designing has been discussed in Chapter VI, hence in this chapter Painting and Finishing will be taken up.

PAINTING

Painting is an art of laying on or adorning with paints or colours It is smoothening to the nerves, as it brings one directly in contact with nature It develops the power of observation and aesthetic taste. It also helps self-expression. Children acquire the habit of seeing life in a pictorial way It is a good hobby It is rich in educational potentialities, as it draws out the inner faculties of the child. Painting gives the child sound training in looking at things in their true perspective.

The papier mache articles do not give an attractive look if they are not painted It is painting which gives them a beautiful and pleasant look. Painting in environmental and natural designs with suitable and pleasing colours makes the article a thing of beauty.

Besides these educational and aesthetic advantages painting has commercial advantages also. The ornamental decoration on the papier mache articles, as we see in Kashmir work, add to their market price.

Painting involves the processes of coating, and using paints and colours.

COATING

Jaipur Method

(i) Prepare a past of 'Bansku Ka Chalk,' by rubbing it on a stone as sandal wood is rubbed to get paste for applying on the forehead Mix it with gum solution. Pass it through a piece of muslin cloth. Allow the solution to settle down. Coat the article with this thick solution with a brush.

(ii) Prepare thick solution of Plaster of Paris Give the article a dip in the solution and allow it to dry

(iii) Dissolve powder colours in gum solution. For first coating of colour, articles should be dipped in this mixture. This process is suggested for the beginners.

Kashmir Method

Take ½ seer of glue of good quality and put it in one seer of water. Boil it to form homogeneous solution. Pass it through muslin cloth to remove impurities. Put into this solution ¼ seer of the required earth colour and mix it thoroughly. Now while this solution is warm, apply it on the article with a thick brush. Use water bath to keep the solution warm First coating with brush will cause streaks in case of unskilled children. For them it is suggested that the glue solution should be applied with a cotton cloth pad or even with finger tips

Articles prepared in Western Method may also be coated in the same way (Fig. 39).

USING PAINTS AND COLOURS

Jaipur Process

(i) Mostly dye colours are used They are cheap and easy to handle Dissolve the required colour in water to get the required value of the colour Prepare some gum solution and mix solution of 'Bansku ka chalk' prepared in the manner as discussed above Now mix all the three solutions in equal quantities.

Paint the articles with this colour All the shades of all colours can be prepared according to need by the same process. Allow it to dry

(ii) *Tempera colours*—Dissovle power colours in gum solution according to need Paint the articles with a brush.

(iii) Oil tube colours mixed with turpentine oil can also be used But they are costly.

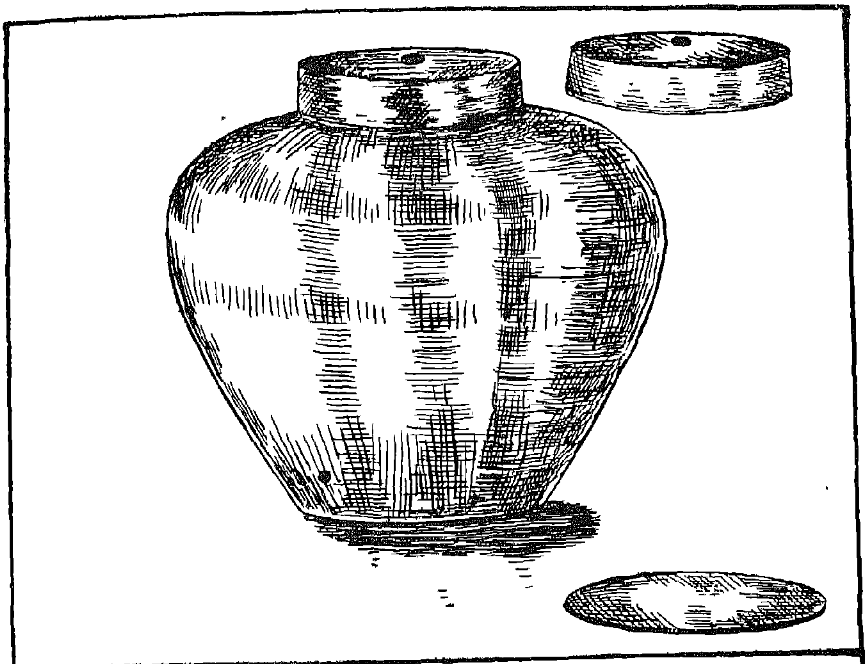
Kashmir Process

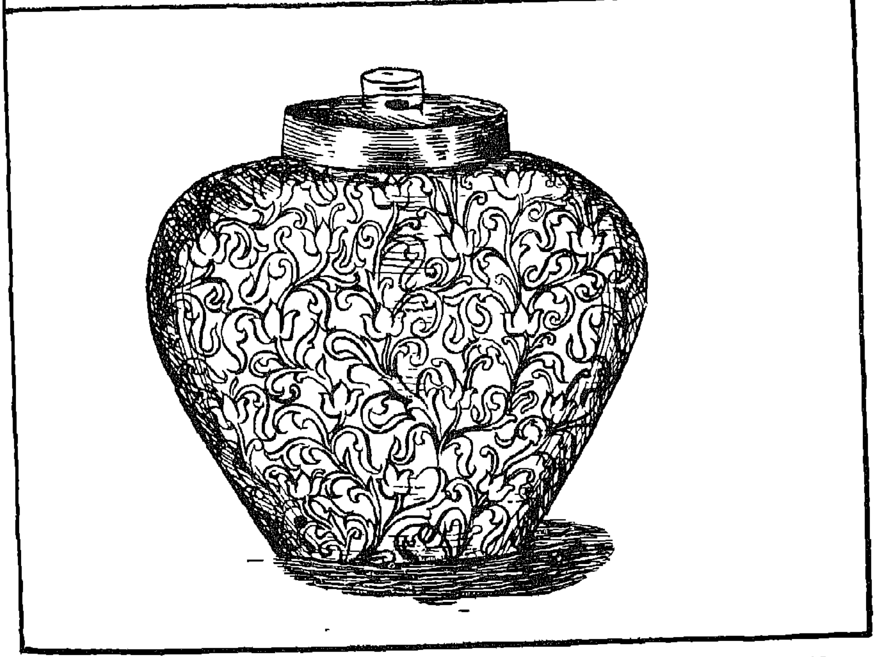
Prepare hot glue solution. The ratio of glue and water should be 1 : 6. Prepare the required paints by mixing powder colours, dye colours or pigment colours in the glue solution. Use them with a brush as they are warm. To keep them warm, water bath as explained above should be used.

However, before painting the desired designs may be sketched on the articles To save time and labour different stencils may be cut in various designs and used as in the case of lino-print.

To bring out minute details even transparent colours which are available in tubes or cakes can be used to a great advantage.

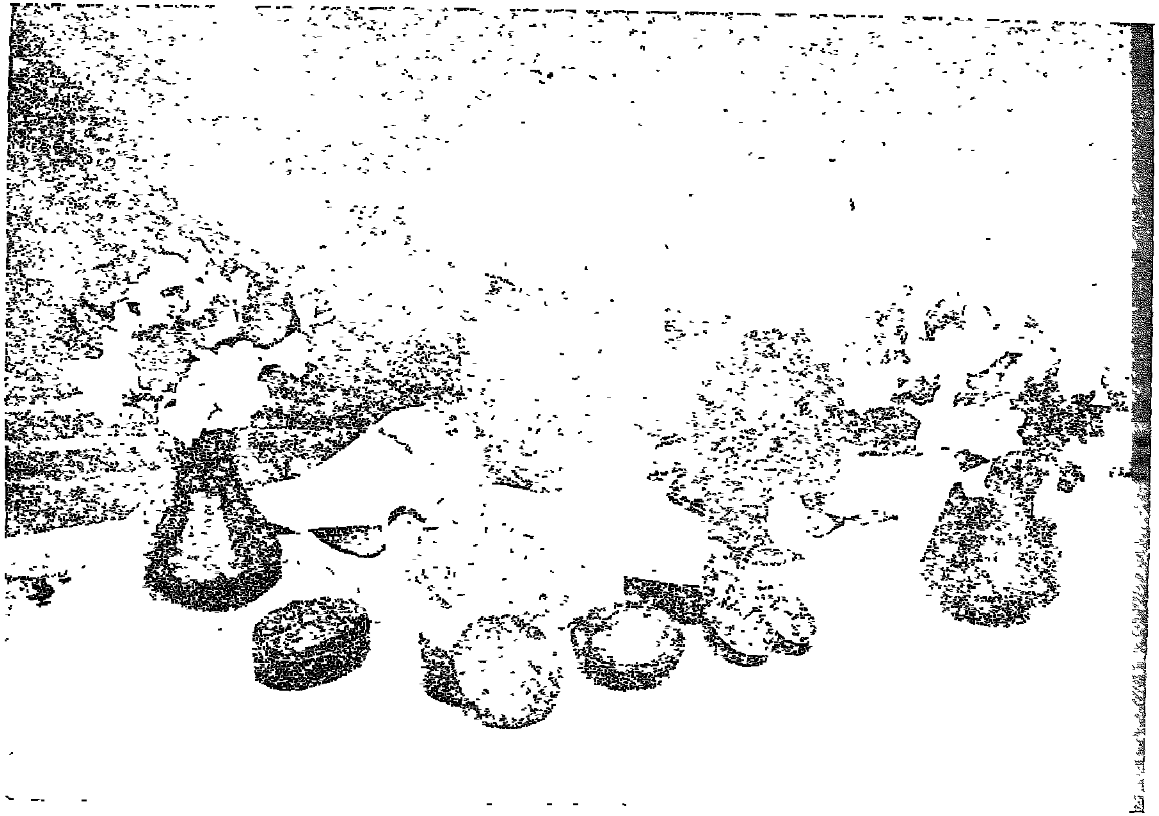
Painting—Coating Fig. 39





Finished Table Lamp Fig. 40

PAINTING THE PAPIER MACHE ARTICLES



SOME FINISHED ARTICLES (PAPIER MACHE)

SOME FINISHED ARTICLES (PAPIER MACHE)

Western Process

Either of the two processes explained above can be used for painting articles prepared by Western Method.

Paints and enamels can also be used for finer articles.

MAKING RAISED DESIGNS

Mix white lead in glue solution in the ratio of 1:6. Use this solution for designing Repeat the application as many times as may give you the required thickness It should then be painted as explained above.

GOLD AND SILVER PAINTS

Take one china soup plate. Take one big sized gold or silver leaf Now apply some glue solution in the centre of the plate. Fix gold or silver leaf on the glue. Take a pinch of powdered salt and put it on the leaf. Rub it with finger tips till the gold leaf mixes with salt thoroughly. Pour water over it very gently and stir it well. Allow the mixture to stand undisturbed for some time. Decant it. At the bottom, the gold or silver paint will settle. Mix little gum and apply this with a brush to the article to be painted.

FINISHING OR GLAZING

Finishing means giving final touches to complete or perfect the articles This is the last stage of the processes.

In Jaipur method, after painting, the articles are rubbed with a piece of cloth. It gives them a fine glaze.

For finishing articles painted in gold and silver, rub with 'agate' stone for glaze. In case the 'agate' stone is not available, it should be rubbed with the base of a hard glass test tube.

A good transparent varnish such as Gopal Varnish also gives a good and brilliant glaze. (Fig. 40).

3

EDUCATIONAL ASPECTS OF PAPIER MACHE CRAFT

Chapter XI

Papier Mache and Correlated Teaching

WHAT IS CORRELATION?

Correlation is the method of linking experience and learning together. It means integrating learning with the experiences that the child gets in the natural environment, the social environment and processes of the productive work or craft If these three areas of experience are carefully studied and fully utilised, there is hardly any knowledge the elementary school boys and girls need to acquire which cannot be drawn or derived from them Learning from experience is more natural, fruitful and simple than learning through books. Learning through experience is active and direct, whereas learning through books is vacarious and indirect and passive. Through a long period of time, during which teachers kept up the traditional methods of teaching through text books, the more difficult method has become apparently the simpler and the more natural and simpler method of correlation appears to be harder and more remote.

Correlation implies the bringing together of productive work and learning into one integral process Productivity in craft is not to be over-stressed Work becomes drudgery if it is simply mechanical and done beyond the capacity of the children. At no time should the teacher forget that the object of Basic education is **education** and that production is only a corollary, however vital or important. Productive work in Basic education is an instrument of education and not an end in itself The work provided should be productive in the sense that it is rich in experiences and not in its economic value. Feeling the dangers of this over-emphasis on craft, Gandhiji gave equal emphasis to both and put them together into one integrated process of learning through work and working for learning Care has to be taken that productivity is not stressed at the cost of intellectual growth Gandhiji has said, "The test of success is not simply the self-supporting character but that the whole personality has to be drawn out and developed through productive work in a scientific manner ') Gandhiji considered the development of the skills of the fingers as an inseparable part of any good education, for boys and girls.

Progressive education calls for the change in the attitude of the teacher. His main function is to help children to learn Teachers should understand this vital standpoint clearly Instead of taking craft and teaching of subject contents as separate independent units, they must explore the possibilities of helping children to collect relevant information and gain knowledge in different fields through the process involved in the productive work This would need careful and scientific planning of work in the form of a project or unit This plan must be progressive and consistent with the different age-groups.

CORRELATION OF PAPIER MACHE WITH VARIOUS SCHOOL SUBJECTS

It is gratifying to note that Papier Mache is a craft which has a very wide scope of correlated teaching of the subject—contents in different spheres of knowledge The varieties of raw material, the various processes ranging from simple to complex ones and the finished articles provide sufficient opportunities for imparting correlated teaching in the various school subjects like Mother Tongue, General Science, Mathematics, Social Studies, Drawing and Painting and Hygiene, etc.

It often happens that the various aspects of a topic are dealt with by various teachers from the point of view of their own subjects. The impact of these lessons on a student is much greater when they are discussed as a unit. The teachers, therefore, must strive for some degree of co-ordination. Papier mache, as discussed above can be correlated with any subject. A few of them are discussed below:—

Papier Mache and Language

Language teachers will find a vast scope of correlating reading and writing of the languages with papier mache craft. Description of some processes, stories about the raw material e.g , paper, paints, gum, plaster of paris, etc., and stories about the people connected with this craft, will provide a sufficient material for a good reader Conversation and oral and written composition can be centred round some processes and also the places famous for papier mache work. For written composition teachers can ask pupils to write essays (descriptive, narrative and reflective) about the topics related to this craft Passages about the life of the people belonging to the countries known for this craft can be selected from some books Some stories or life sketches of the personalities who have done something in the field of papier mache may form a part of the readers. Children may undertake correspondence, with firms which supply raw material and also for disposal of articles prepared. They may be required to write descriptions of toys and give accounts of excursions and journeys undertaken in connection with this craft.

Papier Mache and Mathematics

Teaching of Mathematics will become realistic and natural if it is correlated with the papier mache craft. The teacher will find numerous opportunities when he can make the subject more interesting and meaningful by using some articles prepared in the craft class or while teaching some of the processes. He will be able to create life-like situations in the class room

Counting, numeration and notation can be taught with the help of beads and sticks prepared in the papier mache class. Addition, subtraction, multiplication and division etc, can also be taught through this craft. Ratio and proportion, Unitary method, percentage, interest, Profit and Loss etc., can be better taught and understood if their teaching is correlated with this craft. Volume and Area conception can be better grasped if correlated with this craft.

Geometrical figures e.g, spheres, cubes, cones, cylinders, triangles, squares, rectangles etc., will be better and more easily understood by using the concrete objects prepared from the papier mache.

Papier Mache and General Science

The teaching of Science affords ample scope of correlation with this Craft. While teaching chemical changes, chemical actions and reactions, water—its importance and properties, pressure, properties of alkali, acids and salts, properties and composition of fibres, difference in transparent and opaque bodies, echo and sound, examples can be taken from the various processes used in papier mache. The preparation of paints gives practical training in making solutions The processes of evaporation and boiling can very well be illustrated by correlating with this craft

Papier Mache and Geography

Correlated teaching of Geography with this craft will not offer any difficulty for it is a subject which can be approached through many avenues. The teacher can begin with paper and go to the papier industry, the raw material required for paper, the places where this industry is practised, and also the places from where raw material is obtained. The climate and soil required and the means of transport will also be studied in relation to this craft Pictures and descriptive accounts can supplement what the children are taught through this craft Pupils can be stimulated to read books from the library to gather information about places and life of the people living there In discussing climate suitable for the growth of rice, different seasons of the year with their vegetables, fruits, living conditions and clothing etc, can be taken up.

Papier Mache and History

Even History which appears, to a sceptic mind, a subject having little possibilities of correlation with craft will find a very suitable medium in Papier Mache. History is a record of the progress of human civilisation through the ages. In Basic education history is integrated in the subject of Social Studies where life of man in several stages of social growth is studied Study of the development of the Papier Mache craft will provide a very interesting and natural introduction to the study of national and world history. Students can compare the dwellings, methods of obtaining and preparing food and clothing, the warfare and social life of early peoples with the modern times, while studying the growth and development of this craft through the various stages of civilisation. Pupils may learn about crafts of ancient people and through them about their social life. This reconstruction in thought, if followed by dramatisation of characteristic and interesting scenes from their life will give children a fairly intimate knowledge of history

Papier Mache and Civics

As this craft calls for cooperative work the children learn to organise themselves into social groups under some leaders. They realise the necessity of team work. They also develop sense of discipline and resourcefulness They become aware of their duties and responsibilities They can be taught about the duties and responsibilities of a citizen and administrative heads, types of Government etc

Papier Mache and Hygiene

Necessity of cleanliness and neatness can be brought home to the children while teaching this craft While working they learn how to keep their tools neat and clean and in order The cleaning of clothes and body is very necessary after each process Teaching of principles of health and hygiene can be correlated with this craft

Papier Mache and Art and Drawing

Craft and Art are considered by many as synonymous words They are very closely connected with each other. Everything prepared in the crafts period must be beautiful and artistic Hence the teaching of Art and Craft must be correlated The objects and articles prepared from the papier mache by the students can be given for making their drawing in the drawing period This will give them practice in model drawing. Free hand and creative drawing can be taught by asking them to draw different kinds of designs as will be needed for different articles.

Three specimen units of correlated teaching based on papier mache work are given in Chapter XII.

Chapter XII

Suggested Syllabus of Papier Mache Craft

OBJECTIVES FOR FRAMING THE SYLLABUS

The following objectives may be considered for the preparation of the syllabus in Basic Schools:

1. To develop love for truth and moral values.
2. To provide opportunities to the child to enable him to understand his environment.
3. To afford opportunities to the child to make his full contribution to the wealth of nation in learning through creative and productive activities.
4. To give opportunities to the children for self-expression through the use of hands, colours and speech etc.
5. To lay foundation for the formations of skills of constructive nature
6. To develop aesthetic taste and appreciation of fine art
7. To correlate the teaching of other subjects of the curriculum to make teaching more living and interesting

FACTORS TO BE KEPT IN VIEW WHILE FIXING THE TARGETS

1. Age of the pupils
2. The interests and aptitudes of the pupils.
3. The local environment
4. The utility of the articles prepared
5. Disposal of the finished products

6 Degree of complexity of processes. They should be duly graded and fixed according to different age groups

7. The material and equipment should be locally available at cheap rate Material required and processes involved should not be detrimental to the pupils health The instruments and apparatus should be simple.

TIME

The School year usually consists of 200 working days. The craft work should be given one hour daily for the first two primary classes, 1½ hrs. daily for the rest of the primary classes, and 2 hours daily for VI to VIII classes The time suggested includes the time to be spent on actual operations, on planning of the craft by the pupils and the teachers and also on correlation with other school subjects.

DETAILED SYLLABUS FROM GRADE I TO GRADE VIII

GRADE I

Activities:

1. Collection of waste paper (at least 2 to 2½ srs. during 200 hours of the school year).

2. Recognition of different colours and varieties of paper, such as news print, white printing, paper from exercise books, wrapping paper and art paper etc., and sorting of these varieties.

3 Differentiating varieties of china clay.

4. Helping senior pupils in soaking and beating paper with pestle and mortar Each child should prepare 2 to 2½ seers of *kuttie* (pulp) in one year. The pulp should be 50% of the standard evenness and strength of the standard pulp. The speed should be ½ chattank per hour.

5. Gum—its sources and uses. Collection of gum from trees.

6. Mixing pulp with China clay and gum to make papier mache.

7. Preparation of 50 beads of papier mache (round and oval of ½″ diameter). Making 20 tables and 20 balls of 1″ diameter (Fig. 41).

8 For free expression, preparing coils from papier mache and preparing five simple articles like 'katories', cups, plates and tumblers. (Fig. 42).

9. Making figures in different geometrical forms with beads and balls etc., e.g. squares, rectangles, triangles and circles Preparation of solid figures in these geometrical shapes in ready-made moulds (one each)

10. Colouring the articles prepared by dipping in prepared colour solutions.

11. Use of foot-ruler.

12. *Sensorial Training*—

Training of senses of sight and touch, ability to tell by sight the size, weights and colours of different articles prepared by the pupils.

To judge the quality of different varieties of paper such as news print, art paper, white printing, title paper, marble paper, flint and craft paper etc. by touch, smell and sight

Differentiating various varieties of paper through sounds produced while tearing

13 General idea of plasticity of papier mache in comparison with potter's clay. china clay, flour, dough, etc.

14 Visiting a toy shop.

(N B—Emphasis should be laid on cooperative working of class while making paper pulp, grinding clay and dissolving gum, etc.).

Correlation

1 The story of paper.

2. The uses of paper in community—writing material in ancient and modern times

3. Idea of circle, triangle, rectangle

4 Measures and weights.

5. Counting from beads and writing from 1 to 100

6. Study of environment and collecting leaves suitable for writing and for converting into pulp.

7. Study of local climate—differentiating between the cloudy and sunny days—time required for papier mache to set during cloudy and bright days; Days and nights; variation in the length of days and nights with seasons, seasons round the year

8 Appreciation of craft work under the guidance of the teacher in connection with the articles prepared.

GRADE II

In this class the time devoted will be 200 hours at the rate of one hour per day. Out of these two hundred hours 60 hours will be given to the preparation of 'kutti' and 140 hours for other processes.

All the processes given in grade I will be carried on in this class while doing the following work:—

Activities

1. Each student should attain the speed to prepare one chhattank of kutti of 65% in evenness and strength of standard pulp in one hour. Each student should prepare paper pulp sufficient to make articles required of him during the year.

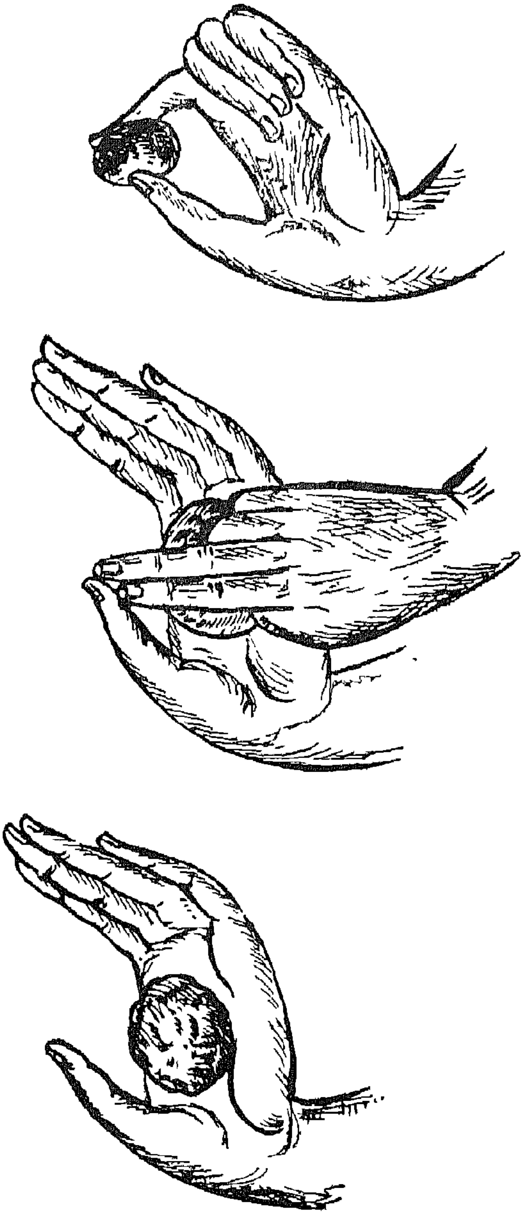
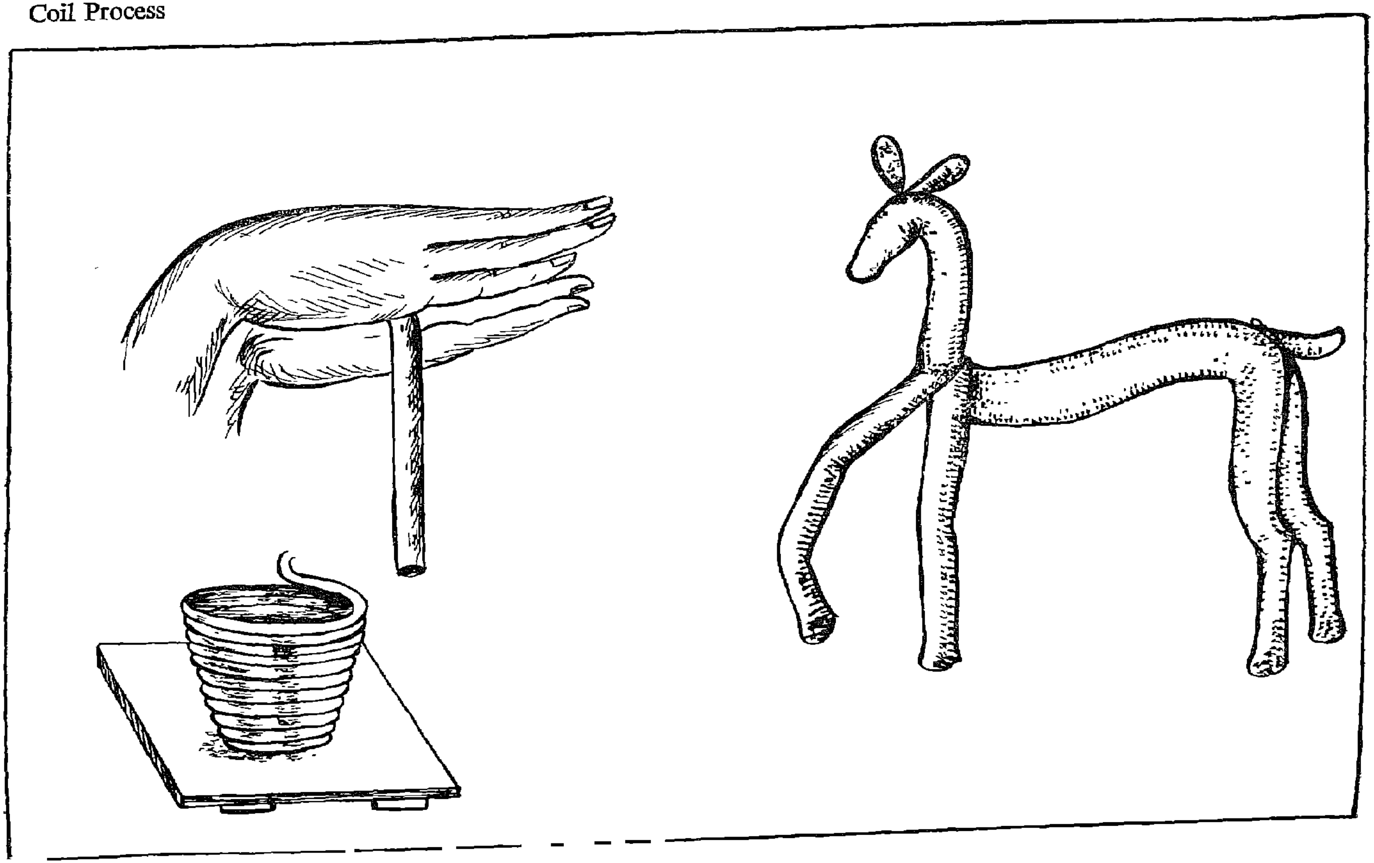


Fig. 42

Coil Process



2 Casting of fruits and vegetables and simple utility articles of papier mache in Plaster of Paris and earthen moulds At least ten articles should be prepared by each student

3 Sponging and smoothening of cast articles.

4. Use of knife, nail cutter and sand paper.

5. Filling the articles with 'kachchi kuttie'.

6. Modelling of birds with the help of round and oval beads (two articles by each student).

7. Colouring by dipping the articles in the prepared dyes. Making colours with simple dye stuffs.

8 Expressional papier mache. Modelling with beads with different shapes such as round, oval and cylindrical

9. Recognition of elementary colours and their uses alongwith tone and shade of colour.

10 Decorating glazed articles with simple geometrical forms and leaves.

11. Preparation of some designs on floor, ground, black boards and slates.

12. Visit to a potter's workshop or a papier mache factory if that exists in the vicinity.

13 Collecting of gum from the trees found in the locality.

Correlation

1. Story of clay; its occurrence in nature, different types of clay, e.g , potter's clay, china clay and multani clay etc

2. Formation of earth—kinds of soil.

3 Elementary colours, simple rules for the application of colours.

4. Simple addition and subtraction in connection with individual and class work.

5. Use of compasses, divider and foot-rule in designing.

6. Personal hygiene—its need and importance, how to maintain cleanliness both personal and environmental.

7. How soap is prepared, how to keep the body healthy, kinds of dirt

8 Distribution of work in the class and community

9 Description of potter's workshop.

10. Appreciation of the work done in papier mache on the basis of the principles of criticism under the guidance of the teacher

GRADE III

In this class the time devoted will be 1½ hours daily, i e, 300 hours in a school year of 200 working days Out of this 80 hours will be devoted for the preparation of pulp of 80% evenness and strength of the standard pulp, the remaining 220 hours should be utilised for other processes. Work suggested in the previous classes will continue with the following additions.

Activities

1 Each student should attain the speed to prepare 1½ chhattank of kuttie in one hour Each student should prepare 'kuttie' for his own use during the year

2. Modelling of solid birds and animals of clay, (ten articles by each student). (Figs 43 and 44).

3. Recognition of tools and impliments required for casting a mould

4. Casting birds and animals of papier mache in clay and Plaster of Paris mould (10 articles by each student).

5. Filling in the depressions (Shaving) with 'kachchi kuttie' Smoothening the articles by rubbing with sand paper

6. Dipping the articles in glaze.

7. Colouring the articles by dipping. Giving details of eyes, nose, ears, etc, with brush.

8. Recognition of secondary colours and their application

9 Drawing of fruits, vegetables, birds, animals, etc, on paper with crayons and pastel colours.

10 Running some project such as fruit and vegetable shop, toy shop and mock zoo etc.

11 Selling the articles prepared and estimating the cost involved in manufacturing the articles.

12. Visit to a fruit and vegetable shop to know the current rates of some fruits and vegetables

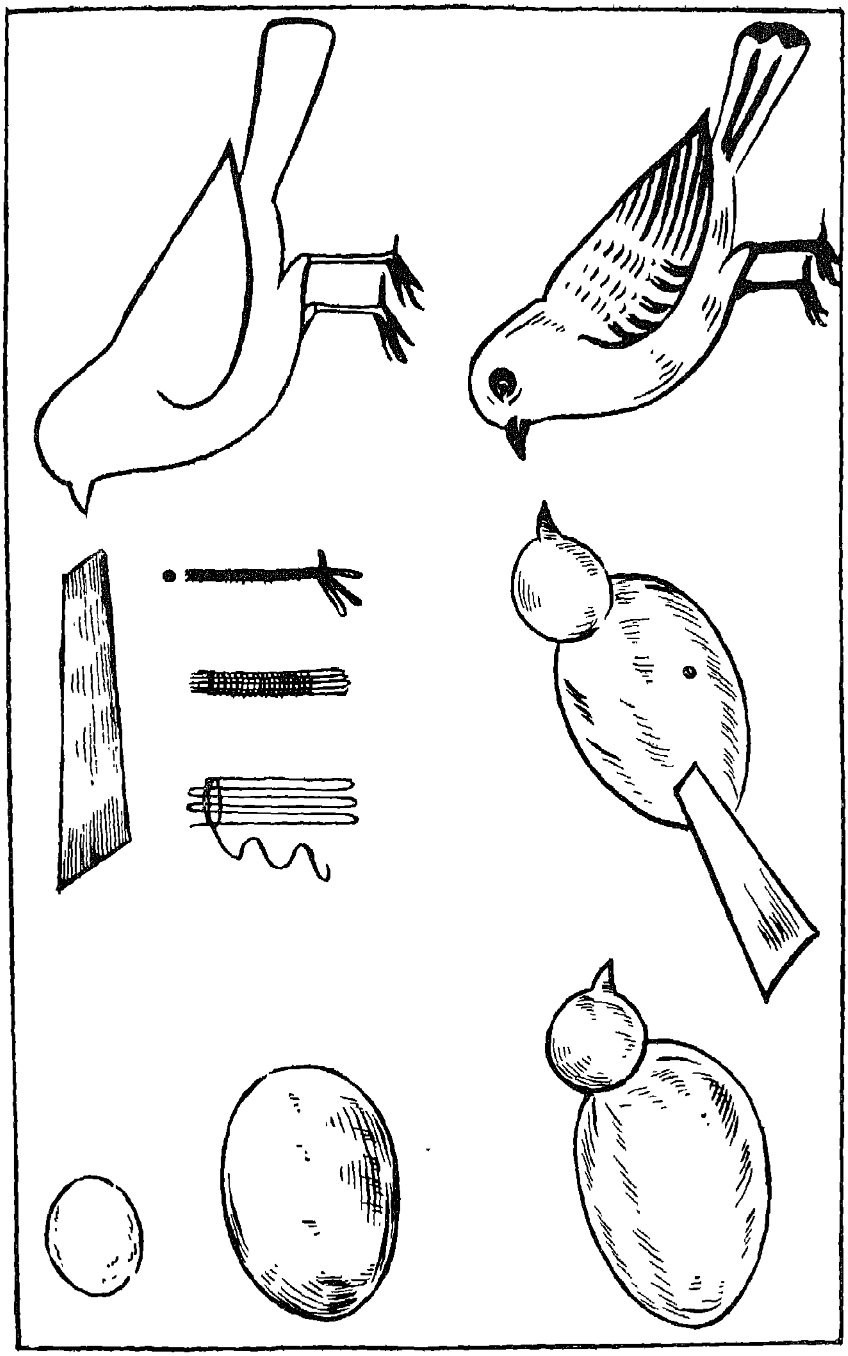
13. Visit to a zoo or a cattle market to get acquainted with different animals

Correlation

1 Classification of summer and winter vegetables and fruit

2 Vegetables and fruits grown in the vicinity.

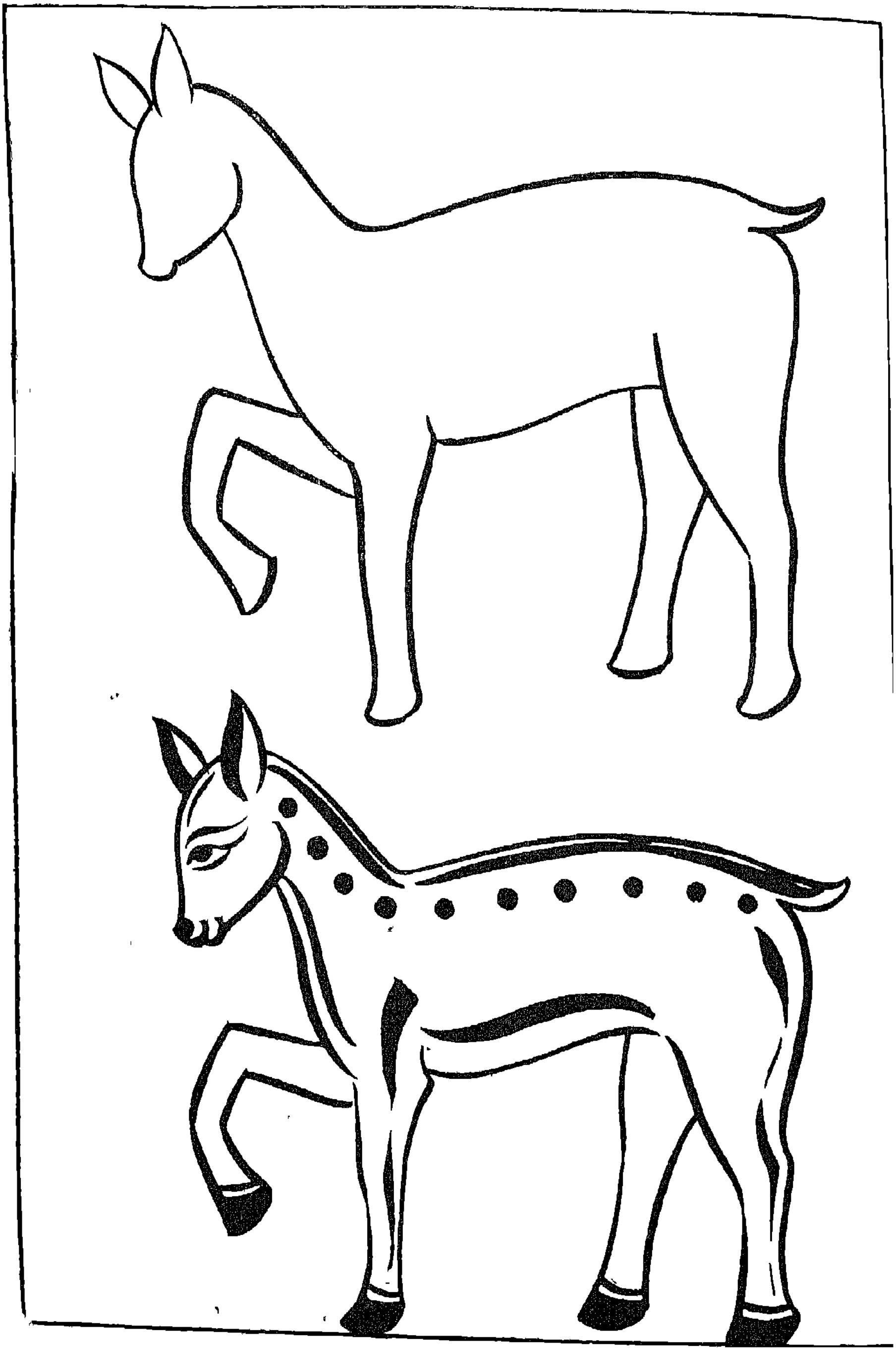
Fig. 43



Modelling of solid birds of clay

Modelling of solid animals of clay

Fig. 44



3. Climatic conditions and soil required for the growth of vegetables and fruits.

4 Manure and its importance in growing vegetables and fruits.

5. Fruits and vegetables imported from other places.

6 Use of map to find the location of these places

7. Means of transport used for import and export

8 Fuel required for trains and automobiles, its occurrence in nature

9. Broad outlines of the principles of steam engine

10 Story of George Stephenson and Wright Brothers.

11 Multiplication and Division.

12 Idea of dozen and score, simple sums to find out cost of vegetables and fruits—simple sums on idea of square, profit and loss and time and speed.

13 Utility of fresh fruits and vegetables. How fruits and vegetables got rotten.

14 Vitamins and food value in different fruits.

15. Glucose and sugar—agents of energy and heat for body.

16 Making a list of tools and raw material required for grade III

17. Life of the house-fly—harm done by it

GRADE IV

In this class time devoted will be 300 hours during the school year. Out of this 80 hours should be devoted to the preparation of pulp of 90% of the standard evenness and strength. 220 hours are to be devoted for the rest of the processes and additional work Children should attain the skill in preparing kuttie at the speed of 1½ chhattank per hour. Each child should prepare pulp sufficient for his use during the year. There should also be an improvement of 10% in quality and speed in the production of articles.

Activities

1. Making of two-piece moulds of clay and Plaster of Paris (one each).

2 Chalk making.

3 Casting of caskets of different shapes out of the moulds prepared by the student (2 each).

4. Casting of birds and animals using Plaster of Paris moulds (10 articles each).

5. Shaving with 'kachchi Kuttie', cleaning and glazing the caskets.

6 Principles of simple harmony of colours; decorating the caskets with different geometrical designs and painting them.

7. Making designs on the basis of repeat pattern on paper and applying suitable colours in designs

8 To draw 'alpna' on the floor of their class room with earth colours

9. To run some co-operative project, e.g., exhibition and show room

10. Visit to potter's workshop showing the kiln or lime kiln to acquaint them with the process of converting gypsum into Plaster of Paris.

N B. Effort should be made to reduce the wastage to the minimum and emphasis should be laid on quality rather than on quantity.

Correlation

1. Gypsum—its occurrence in nature, its conversion into Plaster of Paris, properties and uses of Plaster of Paris

2 Kinds of angles—right angle, obtusee angle and acute angle Use of protractor and compasses in drawing angles of various degrees.

3 Writing of letters to the suppliers of papier mache material.

4 Filling in the Money Order forms and V P P. forms while sending their orders to the suppliers.

5. History of the places where papier mache work is carried on in India

6 Road and railway links

7. Comparative study of potter and papier mache craftsman.

8 Study of flowers, fruits, insects, butterflies etc. to use these as motifs for decorating papier mache articles.

9 Appreciation of the papier mache articles prepared during the year

10. The village pond · insects, plants and birds.

11. Birds found in the locality

12 Describing the day's work orally; record keeping.

GRADE V

In this class time devoted will be 300 hours during the school year of 200 days Western Method will be introduced in this class.

Activities

1. Preparing of flour-paste, by adding sulphate and alum.

2 Pasting of paper pieces on different articles e.g , flat plates, tumblers, trays, bowls and mugs, etc, (10 such articles to be prepared during one year).

3 Use of knife, barber's nail cutter and other tools for chiselling and smoothening the models.

4. Use of sand paper—advantage of fixing sand paper on a wooden block

5. Use of glue while pasting final layer of kite paper.

6 Applying the body colours on articles made in papier mache

7 Designing on the basis of floral and nature study done in the previous class and to achieve proficiency in creative designing.

8 Painting first coat with white zinc and glue solution and to give finish with assorted colours

9. Mosaic work and use of graph paper in designing.

10. Sharpening the tools by the use of oil-stone and water stone.

11. Use of colour, tone, texture, and light and shade effect in painting.

12. Application of Gopal Varnish for protection of colours, to give the articles lustre and making them water proof.

13. To run some co-operative project for all the pupils

Correlation

1 Story of glue and Copal Varnish.

2. Uses animal gelatine forests

3. Specific gravity; measuring specific gravity of oil and water.

4 Story of Archemidese.

5. Water—its composition, utility and sources of supply; difference between hard and soft water.

6. Oils—their uses; difference between mineral and vegetable oils.

7. Ways of excavating mineral oils and crushing oil seeds, procuring oil from trees.

8. Important geological resources of India and sub-soil minerals and other things

9. Comparative study of Rajasthan papier mache and Western papier mache.

10. Short stories about papier mache

11. Life in Europe and its influence on Indian life and history.

12 Flour—its sources, times of sowing and harvesting wheat; Geographical conditions for growing of wheat Wheat growing areas in India

13. Vitamins and food values in different fruits.

14. Glucose and sugar—agents of heat and energy for the body.

15. Copper sulphate and alum—their occurrence in nature and their uses.

16 General appreciation discussed under the guidance of the teacher in connection with the articles produced by the pupils.

17. Visit to the Village Co-operative Society to study its working.

GRADE VI

In this class time devoted will be 400 hours during the school year. Working in the V class will continue with the following additions:

Activities

1. Pasting paper pieces on circular, cylindrical, conical and other artistic moulds of clay, wood or metal, for the preparation of articles such as lamp shades, flower vases, table lamps, containers, soap cakes, powder boxes etc, (10 such articles to be prepared during the year by each student).

2. Removing the Papier mache articles from the moulds by cutting them into pieces or as a whole according to convenience.

3. Smoothening, shaving and cleaning the models with a rasp and sand paper.

4. Stiching and gluing the models with running and lazy dazy stitches.

5 Making the surface of the models suitable for drawing designs and painting.

6 Pasting the paper pieces for covering the stitches.

7. Free-hand drawing and designing, keeping in mind the principles of balance, harmony and continuity

8 Colour combinations, tone, light and shade and texture

9 Glazing and enameling the articles produced.

10 Visits to paints factory, varnish factory, enamel works, clay quarries or any mine whichever is situated in the vicinity.

11. Some projects of pupils to run collectively

Correlation

1 Study of Light—its composite colours as in 'VIBGYOR'. (V=Violet; I=Indigo; B=Blue, G=Green, Y=Yellow; O=Orange; R=Red), reflection and refraction, mirrors, prisms and slabs, angle of reflection, angle of refraction; its application in daily life

2. Formation of earth colours—their occurrence in nature; vegetable colours; metallic oxides used as colours

3 Different metals—their extraction, properties and uses.

4 What is an alloy—composition of some alloys. Study of iron, gold, silver and copper.

5 Oxides of metals and their preparation.

6. Story of goldsmith, blacksmith and their place in community

7 Study of traditional designs found on excavations from Harrappa, Mohanjodero, Texila, Rupar. Ancient art and study from Ellora and Ajanta Caves.

8. Study of ancient Indian and traditional designs

9 Study of principles of designing e.g., harmony, balance and continuity.

10 Study of culture and ancient history of Aryans, Dravidians and other races Story of Koh-i-Noor

11. Average and percentage, simple and compound interest

12 Area of a square, rectangle and of four walls

13. Different fuels used in boiling glue and preparing colours e g., coal, kerosine oil and their sources

14. Distribution of minerals in India

15 Principles of criticism discussed under the guidance of the teachers of the work produced during the year.

16 Examples of mixtures and solutions; chemical combinations

17 Insects harmful for papers.

GRADE VII

In this class time devoted to this craft will be 400 hrs during the school year. Paper tearing and pasting process will continue. In addition Kashmir process i.e., pure pulp method will be introduced.

Activities

1 Beating of paper into pulp of 100% evenness and strength at the rate of 2 chhattanks per hour Each child should prepare paper pulp sufficient for his own use for preparing the required number of articles during the school year.

2. Preparing rice starch by boiling rice in water or from rice flour.

3 Knowledge and working of carpenter's tool.

4 Selecting of moulds and making of simple wooden (one piece) mould. (Each student to prepare two such moulds).

5. Preparing papier mache by mixing rice flour paste in right proportion after squeezing the pulp thoroughly

6 Preparation of 10 articles of papier mache by Kashmir Method and 5 by Western method

7 Practice in shaving and filling.

8. Removing the models from the moulds as a whole or in pieces after cutting the model.

9 Gluing the model pieces.

10. Filling the model with 'gutch' solution (i e, mixture of used Plaster of Paris and glue solution)

11 Smoothening the model by grinding with rabbet or carborundum stone

12 Pasting one layer of kite paper with glue solution and making the model fit for painting.

13 Application of ground colours on the model

14 Painting the designs with earth and tempra colours and to bring out the finest details

15 Application of Copal Varnish on the model

16. Visit to a Paper Mill, Flour Mill, Sugar Mill or Rice Mill and Handicraft Emporium.

17. Some co-operative projects for all the pupils to work collectively.

Correlation

1. Evaporation—shrinkage, cause of shrinkage, comparison of papier mache and clay shrinkage.

2. Simple laws of heat, shrinkage of the crust of the earth, formation of mountains, rocks, volcanoes, gysers, earth quakes, denudation, erosion, rivers, winds, rain, sea, glaciers, ice bergs

3 The story of paper—babhar grass, straw, rags, etc., i e., the raw material—chemical and mechanical processes involved in the preparation of paper

4 Agricultral products of India with special reference to rise and wheat

5 Ratio and Proportion—Mixtures. Time and Work. Profit and Loss, Percentage.

6 Important Alkalies and Acids, their properties and uses

7 Colour combinations, preparing secondary colours out of primary colours

8 Processes of dyeing of woollen and cotton clothes—calico printing, removing stains from woollen and cotton clothes

9 Flower study; still life painting with flowers and drapery—use of graph paper for enlarging and reducing the designs and to create some geometrical patterns for designing Brush control

10 History of papier mache—our relations with Persia and Europe in the ancient times—Trade, Means of Communications, the influence of foreigners on Indian Culture and Craft

11. Writing of the detailed records of the day to day progress of the work done in the papier mache.

12 Principles of criticism to be discussed among the pupils with the help of the teachers on the work done during the year.

GRADE VIII

In this class time devoted to this craft will be 400 hours Two hundred hours should be spent in designing, painting and finishing. All the three processes will be revised Articles of fairly big size and with complicated forms will be taken up As most of the children will terminate their schooling after this class, the aim at this stage should be to develop in the children the skill to produce and finish the papier mache articles upto the market standard.

Activities

1. Preparing paper pulp of standard strength and evenness at the rate of 2 chhattanks an hour Each child should prepare paper pulp required by him during the year.

2. Casting three articles of fairly big size and complicated form by each methd i e., Jaipur, Western, and Kashmir Method and three articles by Ferozepore Method

3. Application of gold and silver leaves direct and by making gold and silver paints.

4 Process to turn the gold and silver leaves into paints by adding sodium chloride and gum

5 Preparing designs of all types and painting the articles in these designs. Glazing or applying a coat of varnish

6 Finishing the articles fit for the market

7 Making the adjustable wooden and clay moulds and multi-pieces Plaster of Paris moulds suitable for all kinds of papier mache work e.g Rajasthan, Western and Kashmir Processes.

8 Making in pencil the designs of various articles which could be used in papier mache work

9 To read and draw the plan, side and front elevation of the design

10 Revision of the Rajasthan, Western and Kashmir Methods

11 To develop the contacts with the dealers for the disposal of finished goods to get the raw material

12 Organising a project of establishing an Emporium in the local market where students may also go in turns and work under the guidance of the manager of the Emporium.

Correlation

1 Story of Gold

2 Banking (Stock and Shares) Discount, Book Keeping.

3. Co-operative Organisations and how industry of papier mache can be run on co-operative lines

4 Cottage industries versus Machine industries.

5 Knowledge of chief cottage industries and machine industries in India—where they are carried on and why.

6 Indian cottage industries versus Asian and European cottage industries.

7 Sodium chloride—its occurrence in nature, its properties and uses, especially in papier mache and pottery glaze

8. Preparation, properties and uses of salts of Sodium, Calcium and Potassium

9. Reflection, refraction and their angles.

10. Writing detailed notes on different methods of papier mache, with drawings of tools, material and processes

11. Principles of criticism discussed under the guidance of teachers in connection with the articles produced by the pupils

12. Study of the co-operative movement in India

THREE SPECIMEN LESSON UNITS

Unit No. 1—*Preparation of Beads, Geometrical figures and fruit toys.*

Centre of Interest—Preparation of Toys and articles of Play Way Methods.

Age Group—8 years.

Class—II

Duration of the Unit—2 weeks.

Lesson No.	Activity	Correlated Knowledge
I	A Procuring material for pulp making and sorting it	*Language*—Writing different names Transcription on 'Takhtis' *Maths.*—Simple addition *Nature Study*—Names of seasons of the year. *Drawing*—Free sketching of fruits
	B Preparation of pulp, grinding of clay and preparation of gum solution.	*Language*—Oral description of the activity in connected sentences *Maths* —More practice in addition. *S Studies*—Benefits of Co-operative activities. *Nature Study*—Clouds and Sun *Drawing*—More practice in drawing fruits

No 1—*contd.*

Lesson No	Activity	Correlated Knowledge
II	A. Casting the articles in moulds of Plaster of Paris.	*Language*—Writing names of fruits and articles from memory
		Maths —More practice in addition
		Social Studies—Story of Plaster of Paris.
		Nature Study—Sun and Air.
		Drawing—Drawing of Geometrical figures such as circle oval, oblong etc
	B. Making colours with simple dye stuffs.	*Language*—Reading from the chart prepared by the teacher.
		Maths —Simple sums on subtraction
		S. Studies—Fruits and their uses
		N. Study—Fruits and trees in the locality
III	A Removing of papier mache articles from the moulds and filling them with 'kachchi kuttie.	*Language*—Writing of a few simple sentences on fruits and trees of the locality.
		Maths —More practice in subtraction. Counting in ½'s upto 20
		S Studies—Source of water supply in the surroundings.
		N. Study—Study of local crop and vegetables.
		Health & Hygiene—Need of cleanliness.
	B Dipping the articles in glaze solution	*Language*—Narration of the activity in simple and connected sentences.
		Maths.—More practice in addition and subtraction. Counting upto 40 in ½'s.
		N Study—Stories about the life of a few birds.
		Health and Hygiene—Cleanliness- Use of dust bins, buckets, latrines and urinals.

No. 1—*concld*

Lesson No.	Activity	Correlated Knowledge
IV	A Colouring the articles. (*i*) Making of pattern (*ii*) Selecting colours.	*Language*—Reading from the chart on colours prepared by the teacher.
		S. Studies—Local means of communication (From red and green signal).
		G Science—Story of George Stephenson.
		Maths —More practice in addition and subtraction. Counting in $\frac{1}{2}$'s upto 50.
		Drawing—Tracing of patterns of designs.
	B. Application of colour	*Language*—Writing names of colours from memory
		S Studies—National flag.
		G Science—Simple methods of purifying water
		Maths.—The same as above
		Drawing—Colouring the designs.
V	A. Visit to a Toy Shop	*Language*—Noting down the names and colours of different toys in the shop.
		Maths —Finding out the cost of toys in Naya Paisas by simple multiplication upto 10.
		S Studies—Artisans of the village.
		N. Study—Learning to enjoy the beauty of flowers in colour, form and smell
	B. Self improvements after the visit to the Toy shop.	*Language*—Conversation based on the visit
		Maths —The same as above.
		S Studies—The same as above.
		Drawing—Creative drawing
VI	Displaying the articles (two lessons).	*Language*—Our Shop (one oral and one written lesson).
		Mathematic—Calculating the cost of articles by simple multiplication.
		S. Studies—Local bazaar.
		Health and Hygiene—Home cleanliness.
		Drawing—Decorating the floor of the shop

UNIT NO 2.

Preparation of trays (oval and circular) bowls, mugs and tumblers and flat plates

Centre of Interest—Preparation of household papier mache articles

Age Group—11-12 years.

Class—V.

Duration of the Unit—2 weeks (12 lessons)

Lesson No.	Activity	Correlated Knowledge
I	A Procuring Moulds of different sizes.	*Language*—Domestic Utensils *Maths*—Calculating cost of utensils by Unitary Method *S Studies*—Civilization in Iron age. *Drawing*—Drawing figures of some utensils
	B. Preparation of papier mache.	*Language*—Supervised study in library *Maths.*—More sums in Unitary Method *S Studies*—The same as above *G Science*—Life of some Indian Scientists
II	A Pasting of papier mache on different articles.	*Language*—Story of Glue or gum. *Maths*—Calculation of cost by Unitary Method *S Studies*—Life in Euorpe and its effect on Indian life *G Science*—Hard and Soft water
	B Preparing of colours for application	*Language*—Nature's gifts.—Poem *Maths*—The same as above *Drawing*—Filling of colours in different geometrical patterns *G Science*—Stories of some Indian Scientist and his inventions
III	A Smoothening the surface of the articles.	*Language*—Nature's gift—Essay writing. *Maths*—More sums on Unitary Method *G Science*—Importance of water to plant, animal and human life. *S Studies*—Rajasthan, the land of sand
	B. Application of colours	*Language*—Story of Oil. *Maths*—Same as above. *G Science*—Different methods of purification of water *Drawing*—Drawing of design.

No. 2—*contd.*

Lesson No	Activity	Correlated Knowledge
IV	A Coating with white lead and glue solution.	*Language*—Local cottage industries (Essay) *Maths*—More complicated sums on Unitary Method. *S. Studies*—Oil producing areas in India *G. Science*—Air and its importance to life
	B. Coating with Basic colour	*Language*—Cooperative Societies. (Prose lesson). *Drawing*—Choice of colours. Warm and cold colours. *Maths*—Colouring the walls and calculating its cost. *G Science*—Alum and its uses in daily life.
V	A. Painting the articles. (*i*) Use of graphs.	*Language*—Story of painting *Maths*—The same as above. *S. Studies*—People in different states in India and their dresses. *G. Science*—White Lead and its uses.
	B Painting the articles. (*ii*) Floral and Natural designs.	*Languages*—The same as above. *Maths*—More complicated sums in Unitary Method. *G. Science*—Artificial and Natural colours. *Drawing*—Drawing floral designs.
VI	A. Application of Gopal Varnish.	*Language*—Story of Shellac *Maths*—The same as above *S Studies*—Uses of Forest. *G. Science*—Dispersion of Light.
	B. Displaying the articles in the show room.	*Language*—Writing the report of the work done *Maths*—The same as above *S Studies*—Industrial development of the country and its importance. *Drawing*—Decoration of the floor of the show room.

UNIT NO. 3.

Making vases, wall pockets and simple statues and dolls and other articles of utility and beauty

Centre of Interest—Making Toys for decorating house on some festival (Diwali).

Age Group—13-14 years.

Class—VII.

Duration of the Unit—2 weeks.

Lesson No	Activity	Correlated Knowledge
I	A Procurement of ingredients of fine papier mache.	*Language*—Autobiography of Rice *Maths* —Ratio and Proportion *Drawing*—Carving out of and drawing of decorative pattern. *S Studies*—Rice growing areas in India *Language*—Essay on utility of paper.
	B Preparation of papier mache	*Maths.*—Ratio and Proportion. *G Science*—Carbohydrates, Rice and its food value. *S Studies*—Climate and soil for rice cultivation.
II	A. Preparation of moulds—(from wood).	*Languages*—Van Mahotswa (Prose). *Maths.*—Ratio and Proportion. *Drawing*—Model drawing *S Studies*—Evolution of the tools of carpentery
	B. Preparation of moulds—(from Plaster of Paris).	*Language*—Story of Ellora and Ajnta. *Maths* —Ratio and Proportion. *G. Science*—Plaster of Paris, its composition, properties and uses.
		Visit to some saw mill
III	A. Filling the moulds with papier mache.	*Language*—Story of Calio printing. *Maths.*—Ratio and Proportions. *Drawing*—Model Drawing. *G. Science*—Effects of Heat on solids, liquids and gases.
	B. Preparation of colours	*Language*—Basant Festival. *Maths* —Ratio and Proportion. *G Science*—The same as above. *S. Studies*—History of colours.

No. 3—*contd.*

Lesson	Activity	Correlated Knowledge
IV	A. Removing the articles from the moulds	*Language*—Visit to a flower garden—Oral description
	(i) Gluing the model pieces.	*Maths.*—Percentage.
		G. Science—The same as above
		Drawing—Drawing and colouring of some flowers and leaves.
	B. Filling with Gutch and smoothening	*Language*—Written descriptions of the garden visited.
		Maths.—Percentage
		S. Studies—Formation of mountains and oceans.
		G. Science—Good and bad conductors of Heat.
V	Painting of Designs on the articles	*Language*—Poem on Beauty of Nature
		Maths.—Percentage.
		S. Studies—Coloured Nations of the world
		G. Science—The same as above
		Drawing—Preparation of Decorational designs.
VI	A. Visit to some Exhibition or Emporium	*Language*—The same as above.
		Maths.—Percentage
		S. Studies—White Nations of the world.
		G. Science—Colour of bodies.
	B. Decorating the room.	*Language*—Essay on Diwali Festival
		Maths.—Percentage and average.
		S. Studies—Alpna and its history.
		Drawing—Decorating the floor of the room with patterns and designs.

A TENTATIVE LIST OF ARTICLES

This is a suggestive list for the guidance of the teachers An intelligent and resourceful teacher can think of various other articles and prepare a list of his own for different grades according to the aptitudes of the children and the syllabus suggested:—

1 Beads (round and oval) and coils.

2 Solid figures, representing geometrical shapes.

3. Nature Study Models—Birds and animals, fruits, and vegetables, plants etc.

4 Articles of Utility—Cups, plates trays, saucers, containers, caskets, small boxes of various shapes and sizes, flower vases, electric table lamps, electric pedestal lamps, pencil cases, ink stand, paper weight, bangle cases, powder cases etc

5 Decorative Pieces—Urns, painted plates, toys and wall pocket, masks.

6 Geographical Models—Globes, relief maps, children of other lands, volcano, rocks, contours, dams, etc.,

7. Historical—Some historical scenes, makes for dramatisation.

8. Physiological Models—Heart, brain, ear, eye, kidney, skin, etc.

9 Botanical Models—Parts of a plant, parts of a flower, seeds, plants with their vertical and cross sections

SOME HINTS AND SUGGESTIONS FR TEACHERS

1 Teacher's own interest in the craft is most essential He must have a good deal of knowledge both practical and theoretical in connection with this craft.

2. He should collect and exhibit articles of really good quality to serve as models for the pupils

3 He should prepare necessary charts showing different processes.

4 Rigid and formal scheme of work should not be adopted. In the first stages the teacher can give definite rules and guidance in technique but in later stages children must be encouraged to experiment and find out the best methods to be followed

5. In case of size of the class is unwieldy it should be divided into handy groups. Each group may be engaged in different work.

6. Quicker pupils may be encouraged to help the slower ones. Though our aim is to develop skills in the individual pupils, yet the co-operative effort should be aimed at

7 For collection of waste material such as waste paper a box or tin may be placed in corner of each class room. Children should be encouraged to collect waste paper and broken or unused articles or toys to be used as improvised moulds

8 Tool-racks should be provided so that the tools may be put back in their proper places after use.

9. Arrangement of water should be adequate. There should be a water tub or tap, so that the pupils may get water to wash their hands before or after taking up a piece of work.

10. Each pupil should have a diary for the recording of his daily work and observations.

11. Teacher should keep a record of a student's progress in the form of charts.

12 Craft work should not generally be taken up at one stretch. However, minimum time devoted at one stretch should not be less than 30 minutes.

13. There should be a separate craft room adequately equipped.

14. Teacher should arrange excursions to Emporia, exhibitions, and fairs in the locality and neighbourhood.

15. In the School itself articles produced with the name of the contributor should be exhibited at least once a term, especially on the Parents' Day.

16. For designing and painting, environmental designs and geometrical patterns should be encouraged. Leaves, flowers, creepers etc., found in the locality may be used for this purpose

17. Students should be allowed freedom of choice in the designs and colours.

18. Use of costly brushes should be avoided Teacher should teach them how to prepare brushes of squirrel hair. Spraying of colour with tooth brushes should be encouraged.

19 Correlation attempted in teaching other subjects of the curriculum should be real and not far fetched.

20. The correlational aspect shown in this pamphlet is only suggestive The teacher should think over it for himself with due respect to the school syllabus, articles prepared, resources available and should make a note of such aspects or topics or items of the syllabus which cannot be naturally correlated through Papier Mache but may be correlated through the social and physical environments through some other craft if practised in the school

21 Teacher is the pivot and should use his discretion and resourcefulness to inspire the pupils and provide them with effective and necessary incentives.

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